Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Telephone Weekly, Telephone Magazine, Telephone Securities, The Telephone and Sound Waves

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CHICAGO, AUGUST 17, 1912

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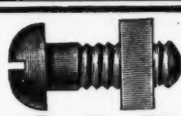

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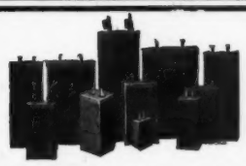

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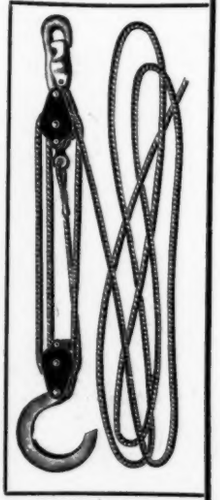

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THE OPEN FIELD

Let us get down to common sense.. When a man favors a single telephone system, is it worth money to the Bell? You all know the kind of single telephone system I favor—one locally owned, operated economically and BUYING ITS GOODS IN THE OPEN FIELD. If the American Telephone & Telegraph Co. would open up the field of purchase to all legitimate telephone manufacturers it would save millions.—J. C. Kelsey.

The Proper Rate-Making Basis.

In its August 3 issue, TELEPHONY printed an article by H. O. Seymour, written to demonstrate that the proper basis on which to predicate the rates which a telephone company should charge for its service should be that of the telephone system as a whole. The article was ably written and brought out a number of points in support of the author's contention.

In printing this article, TELEPHONY stated distinctly that it did not thereby endorse them; that the editors believed in presenting both sides of any question, particularly one so important as this. We also expressed the hope that there would be those among our readers who had definite views on the same question and who would seize this opportunity to express them.

We are gratified to be able to present, in this issue, arguments on the other side of the proposition prepared by W. F. Goodrich, secretary of the La Crosse Telephone Co., La Crosse, Wis., and a prominent figure in both state and national committees which have made telephone accounting a study.

At the time when the Interstate Commerce Commission was preparing to issue detailed instructions to telephone companies under its jurisdiction as to their accounting methods, Mr. Goodrich was one of the Independent telephone representatives called into a discussion of the proposed system, and it was largely his suggestions which caused the commission to withhold its plan for modification.

Mr. Goodrich's article, therefore, may be regarded as authoritative and as embodying the conclusions of an expert. We consider ourselves fortunate to have the opportunity to present his views. We are also glad to note the response from Monroe Johnson, manager of the Emmettsburg Telephone Co., Emmettsburg, Iowa, which is printed directly following Mr. Goodrich's article. We shall be very glad to have other well-informed men express themselves on this proposition, which is of moment to every telephone company.

Some Rules for Public Utility Management.

Writing in Public Service (Chicago), C. W. Kellogg, Jr., offers some interesting ideas as to the relations between a public service corporation and the public. Here are some of his conclusions:

"Make personal politeness, self control and tact an absolute requirement of every employe of the company. The employe's failure in this regard should be disciplined as severely as any other.

"Meet every issue raised by the public promptly, fairly and fully; the reputation thus built up will put the company in a position where it will always get a square deal.

"Make access to the company for information or complaints as easy and as direct as possible and have as few service requirements as possible. The public hates to see the red tape sticking out.

"Make the operations of the policies of keeping friendly with the public continuous. It is the day to day work that counts, rather than spasmodic attempts when trouble arises.

"The company which fails to bear in mind the customer's point of view will never be successful, for the public is simply the customer multiplied by the thousand. Every customer who gets a patient hearing and full investigation or explanation, as the case may be, is one small asset added to the public good will of the company.

"The average man knows nothing specific about the company's organization or lines of responsibility, and feels

that when he is doing business with any employe of the company he is doing business with the company. Legally and practically, he is absolutely right in that feeling, and it is the duty of the company to see to it that each one of its employes properly represents the views and policy of the company, in its relations with the public.

"What the public wants is good service cheerfully furnished and, if it thinks it is not getting proper service, some direct way of finding out why."

A "Tip" on Prospective New Subscribers.

If a manager will watch all his "received" long distance tickets on which messenger service is charged, he will secure some valuable information regarding prospective telephone subscribers. Every person, not a transient, for whom a messenger has to be sent, has use for a telephone and may be successfully solicited for his subscription.

Elbert Hubbard's "Ad Club" Creed.

Recently Elbert Hubbard, that wise oracle and preacher of the gospel of good cheer, enunciated a creed for the "ad club" member. It appeared very generally, yet it may have escaped your notice. It works for others than members of "ad clubs." Here it is:

CREDO:

"I believe in myself.

"I believe in the goods I sell.

"I believe in the firm for which I work.

"I believe in my colleagues and helpers.

"I believe in American business methods.

"I believe in the efficiency of printers' ink.

"I believe in producers, creators, manufacturers, distributors, and in all industrial workers who have a job and hold it down.

"I believe that truth is an asset.

"I believe in good cheer and in good health; and I recognize the fact that the first requisite in success is not to achieve the dollar but to confer a benefit, and the reward will come automatically and as a matter of course.

"I believe in sunshine, fresh air, spinach, apple sauce, buttermilk, laughter, babies, bombazine, chiffon, always remembering that the greatest word in the English language is 'sufficiency.'

"I believe that when I make a sale I must make a friend.

"And I believe that, when I part with a man, I must do it in such a way that when he sees me again he will be glad—and so will I.

"I believe in the hands that work, in the brains that think, and in the hearts that love. Amen and amen."

The Story of a Smile.

It was at the counter of one of our commercial offices, says the editor of the Pacific Telephone Magazine. Owing to the hour and an unusual rush of business, four patrons were waiting for the attention of one clerk. One subscriber was an elderly lady, apparently inexperienced and unused to business; another was a little girl, bashful and unassertive; another was a crusty merchant, eager to see the board of directors; and the last a prosperous looking citizen who seemed to convey the impression that the activities of the business world were at a standstill until his case could be attended to.

Our clerk was a neatly dressed, smooth shaven, keen-eyed young man, and it was a pleasure to watch him in action. He apparently knew his business, for there was no hesitation in his replies to the volley of questions. He semed to wait on all the patrons at once and his best ammunition was his smile. It drove away the embarassment of the old lady and the shyness of the child. It dissipated the grouch of the merchant and the impatience of the business man. With the second application the two men stood back while the lady was waited upon. The child took but a moment. Our employe in the meantime had given each of the others a pleasant word, showing his realization of their presence and interest in their cases.

The crusty man patted the child on the head and Mr. Hasty whistled a popular air. Another smile, with a few words, and the man with the kick said "he didn't understand it before," and thanked the clerk. The same treatment and the hurried man was calm. All left the counter satisfied—the company was free from criticism, and our employe was left cheerfully waiting for the next—with his smile.

This is not a romance, but is the story of an actual situation recently witnessed by the writer in one of our offices. Right here we may interpolate the statement that we probably will be able to say more in the future about this young man with the smile.

Efficiency is based on many attributes and qualities, but one may have theoretical and practical knowledge and yet not have the ability to convert these possessions into results to the fullest extent. A machine may be perfectly constructed in all its parts. Designer and builder may have fully and ably performed their duties, but every child knows that the finished product requires something else in order to best carry out its mission, and that is the elimination of friction. This means the preservaton of the machine, less power to drive it and greater energy produced; in other words, economy in operation and added returns in effectiveness.

The figure may well be applied to human conduct, and the greatest lubricant in those relations is courtesy. One may know his work, may be honest, faithful, and industrious, but these qualities will mean more and will be worth more when exercised through the medium of good nature, and the instrument of good nature is the smile. Use it and watch for results. Its employment does not require a large investment and none is attended with greater proportionate benefits. Not only does the smile spread its good influence externally, but it also brings greater happiness into one's own life.

Use of Motorcycle Increasing.

Motorcycles are becoming more and more popular among troublemen everywhere on account of the rapidity with which they can get from one point to another. One big company reports that, in one week orders were placed for motorcycles by six of its troublemen who have a large territory to cover. By an arangement with this company, the cost to the troublemen of the up-keep of the machine is reduced to a minimum.

Hamilton Home Case to be Dismissed by Ohio Commission

In Conformity With an Opinion By Attorney General of State, Public Service Commission will Dismiss Application of Independent Company for Connection With Cincinnati Over Bell Lines—Law Found to be Faulty in Physical Connection Clause

The case of the Hamilton Home Telephone Co., of Hamilton, Ohio, against the Cincinnati & Suburban Bell Telephone Co., in which the former made a request for an order permitting it to connect with the lines of the latter company in order to reach Cincinnati, is to be dismissed by the Public Service Commission of Ohio. The commission has ordered the representatives of the companies to frame a tentative order of dismissal to be passed upon by the commission. The cause for the dismissal was a ruling by T. S. Hogan, attorney general, who held that the Ohio utilities law was so worded that the request of the Hamilton Home Telephone Co. would not have to be granted.

The letter of the attorney general to the commission was as follows:

> I am transmitting you herewith opinion in regard to the law covering the issue between the Hamilton Home Telephone Co. and the Cincinnati & Suburban Bell Telephone Co. With your permission I would suggest that you make such entry as that the Home Telephone Co. may, if it wishes, submit the statute to the court for interpretation without any prejudice as to the facts. The effect of my holding as to the law would leave your commission without jurisdiction to make the order, and I think the entry should be drawn accordingly. If you were to make an order disposing of the question of the application on its merits the Home Telephone Co., might be unable to submit the matter to the court without prejudice, because your decision might be based on full consideration of all the facts in the case without reference to the interpretation of the statute. The court, of course, would not interfere with your discretion. It would perhaps be well for you before making the entry to hear from counsel for the Home Telephone Co. as to the form of such entry.

In submitting the matter to the attorney general the commission outlined the facts as follows:

> In Butler county there are two telephone systems radiating from the city of Hamilton; one known as the Cincinnati & Suburban Bell Telephone Co. (which is a Bell interest and a part of the system having headquarters in Cincinnati); the other the Hamilton Home Telephone Co., known as an Independent interest. You are probably aware of the fact that in the city of Cincinnati the Bell system is supreme; that municipality never having allowed the Independent interests to effect an entrance. The city of Hamilton ispractically covered by both systems. This is true largely as to the county, but not entirely. Some sections of the county are reached by one system and some by the other. It is fair to say, however, that at the hearing witnesses for the Bell company testified that they were willing to extend their lines to all parts of Butler county to accommodate any prospective patron in the county. But this was strenuously denied by complainants, who put on witnesses to show that they had applied for Bell service and were unable to get it, and in some cases the nearest Bell telephone was two miles distance from their residence.

The commission also asked for a legal opinion as to the meaning of the sentence: "Between different localities which cannot be reached by the lines of either company alone," which appears in Section 66 of the Public Utilities Act, Section 614-63 of the General Code of Ohio.

In his opinion the attorney general pointed out that:

> In view of the fact that the defendant companies contend that inasmuch as Cincinnati is reached from Hamilton by the lines of their companies, that the provisions of law intended by that sentence are satisfied, and that the word "either" means either defendant's line, and inasmuch as the complainant's line does not reach Cincinnati, that said Section 614-63 of the General Code is not complied with and that under said section it is entitled to the right of connection at Hamilton with the Bell line for the purposes above stated, viz: "In order that patrons of the Hamilton Home Telephone Co. may reach Cincinnati from their own telephones."
>
> The full text of the statute, upon the construction of which these cases turn, is as follows:
>
> "The commission shall have the power upon complaint, in writing, by any person, or on its own initiative, by order, to require any two or more telephone companies whose lines or wires form a continuous line of communication, or could be made to do so by the construction and maintenance of suitable connections or the joint use of equipment, or the transfer of messages at common points, between different localities *which cannot be communicated or reached by the lines of either company alone,* where such service is not already established or provided for, unless public necessity requires additional service, to establish and maintain through lines within the state between two or more such localities. The joint rate or charges for such service shall be just and reasonable, and the commission shall have power to establish the same, and declare the portion thereof to which each company affected thereby shall be entitled and the manner in which the same shall be secured and paid. All necessary construction, maintenance and equipment in order to establish such service shall be constructed and maintained in such manner and under such rules, with such division of expense and labor as shall or may be required by the commission." The rule for construction of any statute was laid down by our supreme court, in the case of Slinghuff v. Weaver, 66 O. S. 621, as follows:
>
> "The intent of the law makers is to be sought first of all in the language employed, and if the words be free from ambiguity and doubt, and express plainly, clearly and distinctly, the sense of the lawmaking body, there is no occasion to resort to other means of interpretation. The question is not what did the general assembly intend to enact, but what is the meaning of that which it did enact. That body should be held to mean what it has plainly expressed, and hence no room is left for construction."
>
> The language of the statutes above cited is very plain. It says that the commission may act, either upon complaint filed or on its own initiative, where two or more telephone companies (1) have lines which already form a continuous line of communication, or (2) could be made continuous by the construction and maintenance of suitable connection, or the joint use of equipment, or (3) where such companies could transfer message at a common point, so as to require such companies to transmit calls on such lines already in a continuous line of connection, or to make the necessary connections and then transmit such calls, or transfer messages, between different localities. But all of the foregoing is subject to this qualification, that such orders can only be made for connection between different localities which cannot be communicated with or reached by the lines of either company alone, and where such service is not already established or provided for. But in the latter case, even though some company or companies already have through service between such localities, yet if public necessity requires additional service by the connecting up of more companies whose lines are or could be made continuous, the commission could make the order.
>
> It, therefore, appears that, to enable the commission to act, it must first be established that *neither one of the companies has lines which communicate with or reach both of the localities. Secondly, it must be* shown that the two companies have lines which either

form, or can be connected so as to form, a continuous line between the two localities; that is to say, when joined end to end, neither reaching the whole of the necessary distance. The whole context of the section shows that the legislature did not intend this provision to apply when the lines parallelel. Thirdly, if there is already communication by direct single line or joined continuous lines of some company or companies, then there must be affirmative evidence that public necessity requires the linking up of two new companies, if such there be, whose lines are continuous when joined together, and neither of which reaches both localities by its own independent line.

The word "localities" as used in the act, may be construed by the commission according to the circumstances of each case, so that no precise and unalterable physical limitations can be placed upon it. But from the context of the statute, it would appear that the legislature intended it to mean a whole territory, or the zone of operation of any telephone company. In the cases under consideration, the complaint being in behalf of the Hamilton Home Telephone Co., it is apparent that the whole zone covered by the operations of that company is one "locality" as a whole, while the city of Cincinnati, as a whole, is the other, and not subsidiary parts of either.

Therefore, from a full and careful consideration of the facts stated in your communication, and a most thorough reading and consideration of the law and cases cited in the briefs furnished me by counsel for both complainant and the defendant, I am compelled to reach the legal conclusion that the legislature has not authorized your commission to act where it appears that the defendant company or companies already, without the aid of any other company, connects both localities, in this case, viz: its own exchange in Hamilton and Butler counties.

Under the rule of construction, which he quoted in his opinion and applying it to the section involved in the controversy, the attorney general declared that he was forced to reach the above conclusion, believing the law in its present form is not sufficiently broad to cover a case such as presented by the complainant and that only the legislature can make the necessary changes to cover such cases.

Detroit Merger Approved—Suit Entered to Enjoin.

The Michigan Railroad Commission has approved the proposed merger between the Michigan State Bell and the Detroit Home company, the Bell to buy the Independent for $3,250,000. Shortly after this announcement was made, suit to enjoin the commission and to cause it to set aside the order issued was entered by the Home Telephone Co., of Grass Lake, Mich., on the ground that the transaction would legalize monopoly and stifle competition.

It was hinted in the Detroit papers that the Automatic Electric Co., of Chicago, was back of the move by the Grass Lake company, but this is absolutely denied by officials of the Chicago company, who state that they have no interest whatever in the deal.

After signing the statement, C. L. Glasgow, chairman of the commission, explained his action in a lengthy statement outlining his position. In it he says:

The commission received several letters from the owners of private switchboards in Detroit, asking that their contracts with the Home company be respected, and with this assurance they approved of the merger.

The two questions to which the commission gave most serious consideration were: First, would the merger, which would thereafter require connection with one telephone system only, be beneficial to, and approved by, the public? Second, could the interests of all parties be fully protected by the order?

The commission believed the elimination of the expense and annoyance to the subscriber of the extra or second telephone and the greatly increased number of subscribers which could be reached under the new conditions, would prove popular and decidedly beneficial to each and every subscriber, present and future.

The commission considered withholding the granting of the necessary authority until after the court had passed upon the constitutionality of the act as to the regulation of rates and authority to order physical connections, and had not the committee's report so fully protected these points, such would have been done. It is evident that the commission could not, under the law, do more than require present contracts to be respected. It could not perpetuate them nor insist upon their renewal on expiration, either now or hereafter.

The belief seems to be entertained by many that the cure for all present and possible future ills should be accomplished before the merger be permitted, but the public is reminded that the statutes prescribe the limit of the commission's power, and wherein the law is weak the legislature must correct it. The commission cannot enact law.

The companies named in the order are required to acknowledge receipt of the same and to express in writing their entire willingness in writing to be bound by the terms thereof before such order permitting the consolidation shall become effective.

Michigan Commission to Consider Merger.

The Michigan Railroad Commission will consider, on August 20, a proposal of the Bell interests, to take over the Washtenaw County Home Telephone Co. The latter is a county organization including Ann Arbor, Ypsilanti, Dexter and other towns.

Says Bell Has No Franchise in Des Moines.

The Iowa Telephone Co. is operating in Des Moines without a franchise, is the claim made in Mayor James R. Hanna's report following his investigation of the telephone system in that city. The mayor's report further states that the company is operating without any pretense of a franchise or without any apparent desire for one. He says that he supposed the company goes under the assumption that the state law gives it the right to operate.

"However," continues the report, "I do not believe there is the least ground for the assumption and hold that if the company does not within a reasonable time seek a franchise, defining its relations with the city then we must proceed in some other way to make clear just what this relation may be."

In reply to the question whether there is dissatisfaction with the system the mayor says there is a pretty general complaint against the service.

On the service rendered the mayor says he received replies on the questions of whether it was poor, fair or good as follows: 20 per cent. reported unqualifiedly good, slightly over 40 per cent. said it was fair, slightly over 40 per cent. said it was poor.

He recommends that the Iowa Telephone Co. be made to pay a tax on the gross income, or a tax upon the mileage or poles; that it be required to seek a franchise from the city; and that it be compelled to install either a complete automatic system or a combination of the automatic and manual system.

The mayor urged that the present contract between the city and the company, by which twenty-five free telephones are supplied to the city and 258 city employes enjoy half-rate privileges, be cancelled immediately. He claimed this recognized an old contract assumed by the Iowa Telephone Co. when it consolidated with the Mutual company a few years ago. He said if continued, this practice might be construed to be a continuation of the old franchise.

Mayor Hanna pointed out that a company headed by Henry Riegelman had asked for a franchise to install an automatic telephone system and that the company would guarantee 20 per cent. lower rates. He claimed the Iowa company had not kept pace with the improvements in telephony.

Some Pointers in Private Branch Exchange Testing

Three Factors Which are Misleading in Making Tests—Methods of Testing to Ascertain Condition of the Private Branch Exchange Battery and to Find the True Ground Potential—Formulas and Practical Examples to Illustrate Various Tests

By E. L. Lehman

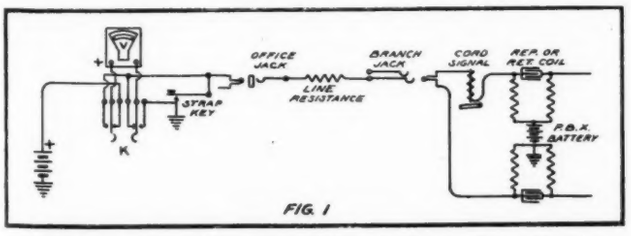
Testing private branch exchanges isn't such a hard thing to do. In fact, the act of testing is just as easy as testing an ordinary line, but knowing the reasons why, and cultivating the ability to detect any different condition which may arise at any time, prove the capability and value of the man who works the keys.

Generally all trunk lines tested toward the P. B. X. show a metallic condenser, as the circuit is through the line, condenser and signal or relay. But there may be a few exceptions, one of which gives a test similar to a two-party line before ringing; after ringing on the line side of the trunk, it tests open line and condenser mate, until the operator inserts a cord, which act causes a shunt across the trunk line. After the branch operator answers a call, the test towards the P. B. X. may be a shunt, battery mate and ground line or any combination of battery and ground on mate, and battery and ground on the line, which may or may not be a correct test, depending on the conditions under which the branch board is working. Such conditions may be line resistance, method of supplying battery to the P. B. X., ground potential and wiring of the cord circuit.

Perhaps of the three unavoidable things that go to mislead one in testing, namely, ground potential, line resistance and voltmeter resistance, the last named is the most misleading of the three. If the meter is comparatively high in resistance, then error for the other two is small, or *vice versa*. To be able to interpret all tests, it is necessary to have a reversed scale, say 10 to 20 volts. For instance, in testing with a 24-volt battery a line that had 40 volts connected to it, the ground reading would be reversed to the extent of 40 — 24 = 16 volts.

The voltage of a P. B. X. battery generally remains constant when the charging current is on and of sufficient strength to keep the battery charged. As the voltage of the office battery is raised five or six volts when charging, a difference in the ground and battery reading may seem puzzling at times. To explain this, let us take for example a ground and battery reading through a branch cord, of 27 and 21 volts.

By reading the ground potential at 3 volts positive to us, we come to the conclusion that, as the ground potential is flowing in an opposite direction to the private branch exchange battery, the difference of ground potential must be added to that of the branch voltage to get the true voltage, which in this case is 24 volts. As the ground reading is 27

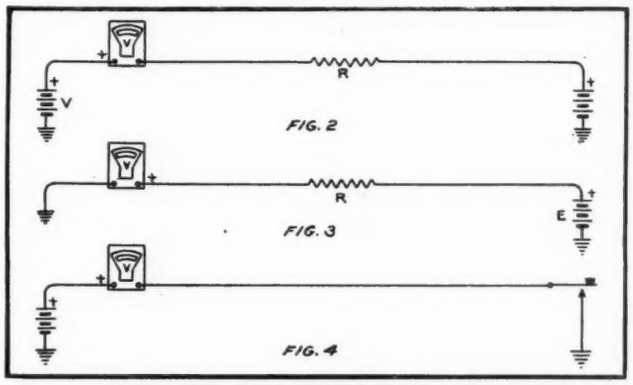


Voltmeter Connections for Testing P. B. X. Cord Circuit.

volts and being in series with the ground potential, a reduction of 3 volts must be made to arrive at a true ground reading, which, in this case, is 24 volts. Thus it is seen that while a difference of 6 volts is read, after allowances are made, there exists no actual difference.

Fig. 1 shows a method of connecting a voltmeter to test a branch exchange cord circuit. In Fig. 2 is the same method reduced to simpler form. In this the branch battery is negatively grounded, as is the testing battery. Fig. 3 represents the same circuit the key K operating, which opens the testing battery, reverses and grounds the negative pole of the voltmeter.

The operation of the strap key to get a reading of the testing battery is shown in Fig. 4. In Fig. 5 a change in the key



Simplified Diagrams of Testing Circuits.

connections is made to enable the operator to get a battery reading of a branch when the positive pole of the battery is grounded. Fig. 6 shows a condition when measuring a difference of ground potential.

In the expressions to follow,

Let V = the voltage of testing battery.
E = the voltage of P. B. X. battery.
G = ground reading, or the reading taken when using the testing battery.
B = voltmeter reading of P. B. X. or foreign battery.
r = voltmeter resistance.
s = scale of voltmeter.
PR = potential reading of ground.
TP = true potential of ground.
Bl = battery line, as in Figs. 3 and 7.
Bm = battery mate, as in Figs. 3 and 7.
Gl = ground line, as in Fig. 7.
Gm = ground mate, as in Fig. 7.
Rl = resistance line, as in Fig. 7.
Rm = resistance mate, as in Fig. 7.
K = voltmeter constant, or current per volt reading.
R = total external resistance, voltmeter excepted.

When testing a private branch exchange for reported trouble, the first question is, "How is the battery or source of supply?" To be able to reply to such a question is the object of this article, and to this end let us assume a ground reading of 5.6 volts, a battery reading of 16.8 volts and the *e. m. f.* of the testing battery to be 24 volts. Then for a condition as shown in Fig. 2.

$$E = \frac{\frac{V}{G} B G}{B + G} = \frac{\frac{24}{5.6} \times 16.8 \times 5.6}{16.8 + 5.6} = 18 \text{ volts.} \quad (1)$$

As the decimal figures will not be carried beyond two or three figures, the result will be slightly greater or less, as shown by the positive and negative signs.

Having found E, the other constant R, the line resistance, is useful at times, as the problems to follow will show.

$$R = \frac{V - E - G}{\frac{G}{r}} = \frac{24 - 18 - 5.6}{\frac{5.6}{3000}} = 214 \text{ ohms.} \quad (2)$$

$$\text{Solving for } G = \frac{\frac{V - E}{R + r}}{K} = \frac{\frac{24 - 18}{214 + 3000}}{.00033\frac{1}{3}} = 5.6 \text{ volts.} \quad (3)$$

$$\text{Also } V = \frac{G}{r}(R + r) + E \quad (4)$$

$$= \frac{5.6}{3000}(214 + 3000) + 18 = 24 \text{ volts}$$

$$\text{and } r = \frac{G}{\frac{V - (E + G)}{R}} = \frac{5.6}{\frac{24 - (18 + 5.6)}{214}} = 3000 \text{ ohms} \quad (5)$$

$$\text{for all cases. } K = \frac{\frac{s}{r}}{s} = \frac{\frac{50}{3000}}{50} = .0003\frac{1}{3}. \quad (6)$$

Fig. 2 illustrates a condition where the P. B. X. battery is grounded with the same polarity as the central office battery. This is done in order to charge the P. B. X. battery from the central office battery. However, the condition in Fig. 2 may exist for other reasons, one of which may be for the purpose of overcoming the resistance of a long trunk line, thus enabling the supervising signals to operate.

Using the same testing voltage of 24 volts, the battery reading of 12 volts and a ground reading of 28 volts, which in this case is considerably larger, owing to the fact that the testing battery and the P. B. X. battery are in series, as Fig. 5 shows, and solving for E we find the P. B. X. voltage.

$$E = \frac{\frac{V}{G} B G}{G - B} = \frac{\frac{24}{28} \times 12 \times 28}{28 - 12} = 18 \text{ volts.} \quad (7)$$

$$\text{Solving for } R = \frac{V + E - G}{\frac{G}{r}} = \frac{24 + 18 - 28}{\frac{28}{3000}} = 1500 \text{ ohms} \quad (8)$$

$$\text{to find } G = \frac{\frac{V + E}{R + r}}{K} = \frac{\frac{24 + 18}{1500 + 3000}}{.00033\frac{1}{3}} = 28 \text{ volts} \quad (9)$$

$$\text{and } V = \frac{G}{r}(R + r) - E = \frac{28}{3000}(1500 + 3000) - 18 = 24 \text{ volts.} \quad (10)$$

$$\text{Also } r = \frac{G}{\frac{V + E - G}{R}} = \frac{28}{\frac{24 + 18 - 28}{1500}} = 3000 \text{ ohms.} \quad (11)$$

To find E by the method in Fig. 3, which applies to either positive or negative grounded batteries.

$$E = \frac{B}{r} R + B = \frac{12}{3000} 1500 + 12 = 18 \text{ volts.} \quad (12)$$

$$\text{Solving for } B = \frac{E}{R + r} r = \frac{18}{1500 + 3000} \times 3000 = 12 \text{ volts.} \quad (13)$$

$$\text{Also } R = \frac{E - B}{B} r = \frac{18 - 12}{12} \times 3000 = 1500 \text{ ohms.} \quad (14)$$

$$\text{and } r = \frac{B}{\frac{E - B}{R}} = \frac{12}{\frac{18 - 12}{1500}} = 3000 \text{ ohms.} \quad (15)$$

Having solved the problems of conditions in Figs. 2, 3 and 5, the condition shown in Fig. 6, where a difference of ground potential exists, may be considered in connection with Figs. 2 and 5.

Ground potential, as every tester knows, has its advantages as well as disadvantages. Probably the greatest disadvantage from a testing standpoint lies in the fact that, unless the voltage and direction is known, some bad mistakes might be made. To illustrate, take for an example a party line and telephone, the 1,000-ohm bell of which is connected to ground. A circuit similar to that shown in Fig. 3 is formed using a 24-volt testing battery with a 3,000-ohm voltmeter, in which the ground or battery reading may be taken.

In this case the ground and battery reading would be the same, the difference is merely at the end to which the voltmeter is connected. It should be 16 volts neglecting the line resistance, and if a difference of 5 volts ground potential exists in the opposite direction to that of the testing battery, the ground reading would be 11 volts. Then if the total resistance is calculated by formula No. 14 a total of 3,545 ohms would be obtained. Knowing the resistance of the bell to be 1,000 ohms, we find ourselves at a loss to account for a difference of 2,545 ohms.

The true ground potential when the resistance to the point of ground is known, assuming R to be 1,200 ohms and the potenial reading to be 9 volts is found from the formula

$$T\ P, \text{ the true potential} = \frac{B}{r}(R + r) \quad (16)$$

$$= \frac{9}{3000}(1200 + 3000) = 12.6 \text{ volts.}$$

This result shows a difference between the actual and the true reading of 3.6 volts, or about 72 per cent. correct. This may be further illustrated in the conditions shown in Figs. 2 and 5, which may be considered as having a difference of ground potential between the ground points of the testing battery and the P. B. X. battery. When this potential exists, allowances must be made.

Having found the true ground potential by formula No. 16 when in series with the P. B. X. battery, the condition shown in Fig. 2, the expression for E is

$$E = \frac{\frac{V}{G} B G}{B + G} - T\ P \quad (17)$$

When the ground potential is in an opposite direction to the P. B. X. battery, then

$$E = \frac{\frac{V}{G} B G}{B + G} + T\ P \quad (18)$$

In the condition shown in Fig. 5, the ground potential is in series with the P. B. X. voltage, but in an opposite direction given in formula No. 17, and is

$$E = \frac{\frac{V}{G} B G}{G - B} - T\ P \quad (19)$$

while with a ground potential in an opposite direction to the P. B. X. voltage for Fig. 5, the expression becomes

$$E = \frac{\frac{V}{G} B G}{G - B} + T\ P \quad (20)$$

Fig. 7 shows the condition when testing a branch battery through the cord circuit of the P. B. X. that is grounded at the central office, or known as a metallic charge. The resistance lamp regulates the current supplied to the branch battery

(*Continued on page 222.*)

Application of Cost Principle to Telephone Rates

An Argument for the Unit Principle of Rate Fixing in Answer to Article of H. O. Seymour, Printed in These Columns August 3, and which Declared for the Establishment of Rates Based Upon the Telephone System as a Whole

By W. F. Goodrich

Secretary LaCrosse (Wis.) Telephone Co., Member Accounting Committee, National Independent Telephone Association, and Chairman Accounting Committee, Wisconsin State Telephone Association

The question of the application of the cost principle to telephone rate making is attracting considerable attention at the present time. Much has been written of late on the subject and there are many differences in the opinions expressed as to the basis to be taken in establishing rates which will be at once fair to the utility and to the subscriber.

In the article by Mr. Seymour, which appeared in the August 3 issue of TELEPHONY, after claiming to base the operation of a telephone plant on the same principles adopted in railroad operating, he concluded with the assertion that:

> It is the property as a whole and, in considering rates for any or all classes of service, the operation of the company as a whole must be taken into account, its total investment, total expense and total revenue; and the reasonableness of a particular rate must depend upon the net earnings of the utility as a whole and the value of the particular service as determined by comparison with rates ordinarily charged for similar and other classes of service.

Let us for a moment consider the composition of a telephone exchange. We have the exchange switchboard connecting each of, say 3,000 subscribers, and each subscriber is entitled to this service in payment of a certain rental, which rental is based on the cost of operating plus a fair return upon the investment. This exchange is a small community all of itself and has no means of communicating with other communities. Under these circumstances, there can be no doubt but that the rates in that community will be based on the cost of service plus interest on the investment, with no regard to the rates which are charged in an exchange of 1,000, 2,000, or 5,000 subscribers situated even a few miles away. And why should there be? Cost of labor differs; construction requirements and costs differ; and there is no good reason why one community should pay the excess costs of another community any more than that a uniform price for coal should be established so that the manufacturer situated farthest from the base of supply would pay the same price as the manufacturer situated at the pithead.

A toll line is built connecting one exchange with another and this involves an additional investment of capital, but it does seem that this addition represents a new venture and a separate branch of the investment. Capital has been interested in this new branch by reason of the prospect of receiving a fair return for its use. Any subscriber desiring to use the toll line is charged a certain sum for the privilege. A certain part of this sum is charged by the exchange for handling the message and for the use of its equipment, and the balance is the revenue to the toll line.

This condition exists very largely all over the northwestern states today where the Independent companies own an exchange system and nothing else and connect with the toll lines of other companies for long distance communication.

The exchange company must have its fair return and likewise the toll company must have its fair return.

It is often contended that the toll facilities increase the value of the service of the exchange and, while such is undoubtedly true, still it does not follow that there is no line of demarcation in the cost and value of the two services.

We have been referred to the terms "fat" and "lean" territory as a plea that it is the property as a whole which must be considered in fixing rates. What relation can there possibly be, as far as exchange business is concerned, between exchanges of the same company located in Racine and in Superior? Or, to carry the test still further, what interdependence of exchange business is there between subscribers in Milwaukee and those in Pittsburgh?

The attempt to use the entire system as the basis for the application of the cost principle to exchange rates leads to a situation which is little short of ridiculous. Suppose, for example, that all the telephone business in this country were under one management, could it be seriously argued that New England exchange telephone rates should be to any extent determined by the profits which the company was making on exchange business in southern California? This may be an extreme example, but it is the logical outcome of any attempt to use the entire system as a basis for the application of the cost principle, rather than the individual exchange.

It may be good commercial business policy to exploit "lean" territory by giving service at cost or less than cost, and also to give service at a similar rate for a time in "fat" territory in order to stifle competition and secure an unrestricted monopoly, but the public utility law has done away with the necessity for such methods and aims to prohibit their use, giving in exchange a monopoly, guaranteeing a fair return upon the capital invested. It insists that each community shall pay a fair price for its service based on the costs of operating the exchange in that community.

RATE IN ONE TOWN NO BASIS FOR RATE IN ANOTHER.

Suppose that a concern were engaged in supplying electric current to all the towns in the state of Wisconsin, would it be argued that, because the business was not profitable in Ashland, the consumers in Janesville should make up this deficit?

What bearing can the present individual line business rate of $4 in Eau Claire have on the present individual line business rate of $3 in La Crosse, with a larger plant investment in La Crosse, when every subscriber who talks between those cities pays a separate additional toll charge for his message, presumably to pay for the maintenance of the toll line?

Such a conclusion is hardly in line with the principles established in connection with the regulation of public utilities other than telephone, yet there is just as much interdependence between consumers of electric current in Ashland and Janesville as there is between the purely exchange business of telephone utilities operating in those two cities. And, if telephone exchange rates in Janesville are to be affected by exchange conditions in Ashland, it would be only reasonable to apply the same principle to the electric business.

There is no analogy here to the business of a common carrier where all parts of the system are interdependent and where portions which are not profitable in themselves constitute a valuable part of the system because they act as feeders for other portions.

If we consider the principle established then that, as far as exchange business is concerned, each exchange area should constitute the basis upon which the cost principle should be applied to exchange telephone rates, we must assume the responsibility of determining what is the cost of rendering exchange service in each exchange.

Division of Exchange and Toll Costs.

Mr. Seymour states that any separation of investment and operating expenses as between exchange and toll business is purely arbitrary and cannot be logically or accurately made. If, by an arbitrary apportionment, Mr. Seymour means any division of expenses which can not be taken directly from the records of the utility, his statement is probably correct. No accounting system can be installed which, of itself, will entirely separate toll expenses from exchange expense. Some of these must be apportioned between the two classes of business, but we do not agree with Mr. Seymour that this apportionment must be made upon a purely arbitrary basis.

Apportionments of expenses have been made in connection with the business of practically every other class of utility. In the railroad business, freight expenses are separated from passenger, and expenses of interstate traffic are separated from those of intrastate traffic. The principles underlying these apportionments have been carefully studied and may be considered to be well established.

An apportionment of telephone expenses would involve a study as careful as that which was required in arriving at a basis for apportioning the expenses of a railway business. But to state that this apportionment must be upon a purely arbitrary basis is to deny the fact that there exists a relation between cost of service and elements which enter into the conduct of the business of the utility.

Not all expenses, of course, can be apportioned upon the same basis, but all expenses which enter into the telephone business are related to some element or process, or more than one element or process, in connection with that business just as the same is true of the railway business. And just as surely as it is possible to apportion the expenses of a railway business, it is possible to apportion the expenses of a telephone company between its local and its toll business.

This discussion is not concerned to any extent with the question of toll rates. As suggested above, it may very well be that the analogy between the toll business of a telephone company and the business of a common carrier is nearly enough perfect to justify departure from the cost principle in order to secure the greatest development of the business as a whole. It is said by Mr. Seymour that an apportionment of investment between exchange and toll business is impossible. He calls attention to portions of the telephone equipment used in connection with both exchange and toll business, which because of their use in connection with the toll business must be of a different nature than those formerly used where only exchange business was done.

It seems probable that the importance of this situation has been overstated. At the present time, the furnishing of adequate exchange service involves the use of equipment in large measure the same as is used in cases where long distance service is also furnished, and the added cost due to the conduct of toll business is properly not as great as one might infer from Mr. Seymour's article. It is true, of course, that the apportionment of investment could be made only after careful study, but the same has been true in every line of utility business, and this objection does not seem to be particularly applicable to the telephone business.

As regards rates for different classes of service within the area served by any exchange, whether we assume that each exchange should stand by itself, or that the entire system should be considered a unit, it is the argument of Mr. Seymour that anything approaching a cost basis is impossible. Here there is undoubtedly an interdependence between subscribers and between classes of subscribers, and it probably is true that the greatest development of the exchange business must sometimes be accompanied by departures from rates based strictly upon the cost of service.

This understanding of the situation, however, seems to be based upon the idea that the cost-of-service principle would hold the party originating the message responsible for the entire cost of that message. For example, certain classes of business telephones might originate very few messages, yet if they received a great many calls, they would be considered as having a high value.

It seems to have been assumed by Mr. Seymour that the idea of value of service could not be reconciled with that of cost, and perhaps this cannot be done absolutely, but it is very doubtful whether the cost of a message should be borne entirely by the party originating it. If both parties are considered as sharing in the cost, as both parties unite in the responsibility for the message, there will be less of a discrepancy between the value of exchange service and the cost of that service.

The cost of single-party service is, of course, greater than that of two-party or four-party service to the same class of subscribers. As a general proposition, it may be assumed that only those subscribers are taking one-party service who have need for it. In other words, they would use one-party service only in cases where their business is sufficient to be worth what is charged for that class of service.

Relation Between Rate and Business Done by a Telephone.

There is a relation between the class of service taken and the amount of business originating or received by the telephone. There are exceptions to this, undoubtedly, but as a general rule this seems to be true, and as the use of the telephone by any subscriber develops to a point where a higher grade of service is required, the value of that service to him may be presumed to have increased, and the cost of it will increase also.

As among subscribers in the same general class, for example, among residence subscribers, the rates for different classes of residence service do have a relation to the cost of that service, although they may not be based strictly upon the cost basis, and as the value of the service to the subscriber increases so that he uses a higher grade of service, the cost increases also, and to this extent the cost principle is an established feature of telephone rate schedules.

As between different general classes of service, however, for example, between business and residence service, it is contended by some that the cost principle has not been followed and that, in fact, the use of this principle would make residence rates even higher than business rates, because of the fact that it is often necessary to construct lines for relatively long distances in order to secure residence service. We believe, however, that the principle of interdependence of classes of service applies here also.

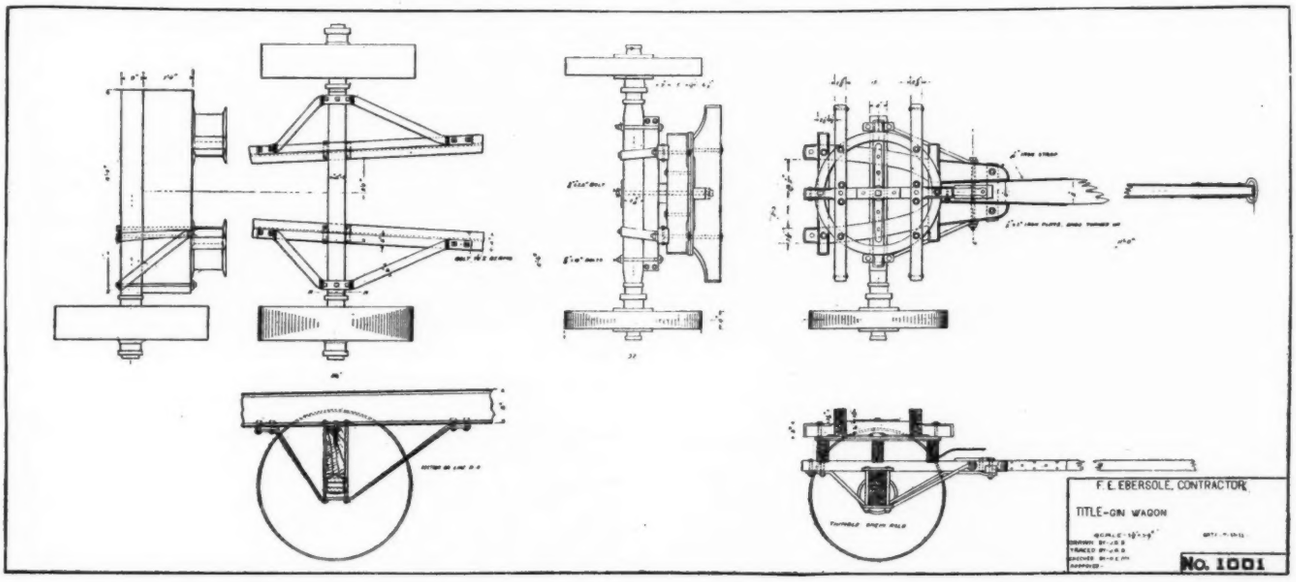
When a residence subscriber calls a place of business, not only that residence subscriber is securing the use of the investment put in for his telephone, but the place

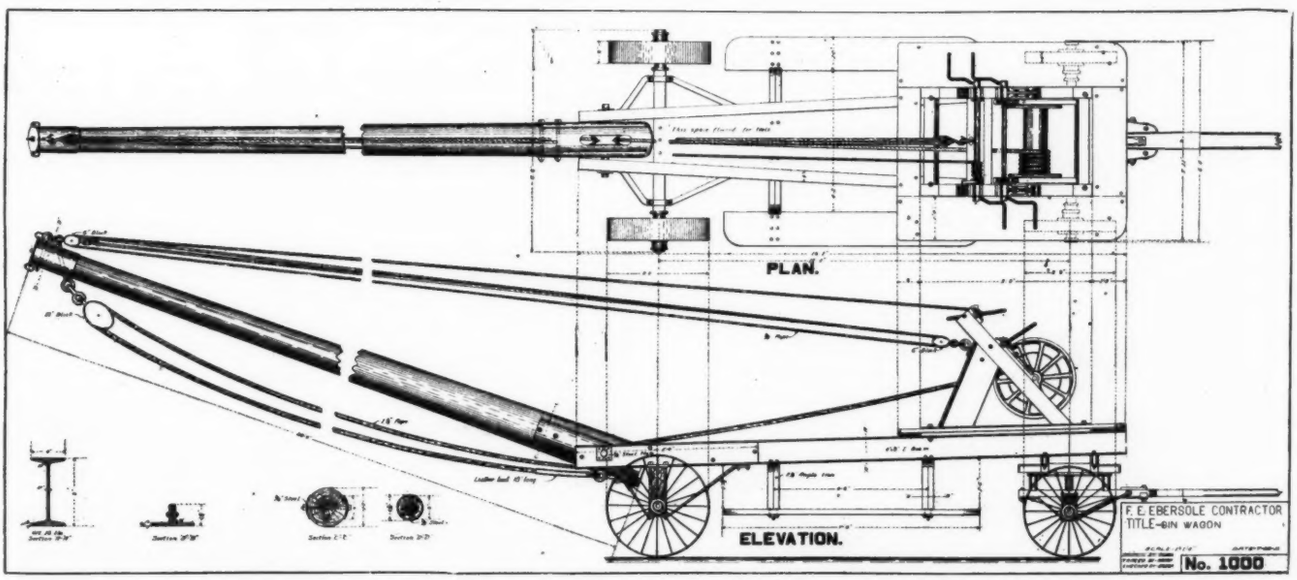
(*Continued on page 228.*)

A Practical Gin Wagon for Telephone Construction

Plans and Description of Apparatus Designed and Worked Out by Frank E. Ebersole and Employed in Building the Independent Telephone Plant at Houston, Texas—Multiplicity of Uses to Which It May be Put—Built at Reasonable Cost

In pole line construction work, the methods which require from four to eight men, and from ten to twenty minutes to set a pole are fast becoming obsolete. Where a number of poles are to be set, some form of a derrick is now commonly used. An arrangement of this character is a gin wagon designed by F. E. Ebersole and built under his direction for use in the Independent system which he constructed at Houston, Texas.





Plan and Elevation of the Ebersole Gin Wagon and Details of Its Principal Parts.

The plan and elevation of the wagon are shown in the drawings. As indicated by them but little wood is used in its construction, steel "I" beams and angle iron forming the framework. The boom will raise to 28 ft. 6 in. and an extension can be placed upon it which will make the distance 55 ft., so that any size pole can readily be handled.

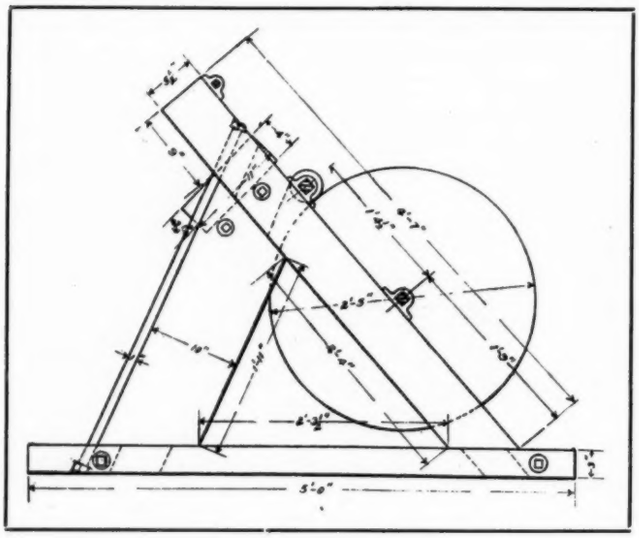
The machine will lift a dead weight of 11 tons without guying sidewise, although when an unusually heavy weight is to be lifted guys are sometimes used. A special team of big mules is used for drawing the wagon from place to place.

In Houston, an average of 72 poles per day were set by the use of this wagon. But four men were necessary for the work, they being the driver and helper and one lineman and a helper. In the setting of poles in Houston, some 60 to 80 foot poles were replaced. Some of these were in the middle of awnings which extended out from the sidewalks and it was necessary to replace the poles without interfering with the awnings. They were picked up and taken out of the way with an eight-man gang.

The setting of poles is not the only thing for which this wagon is used. It has been used on several occasions

for placing safes in the upper floors of buildings. Recently an Overland automobile, which was being unloaded from a car, got beyond control of those in charge and ran down an embankment, landing about 25 or 30 feet below the street level. The automobile lodged against a tree at the bottom, upside down.

The agent of the automobile company went to Mr. Ebersole and persuaded him to use his gin wagon in getting the machine out of the ravine. The wagon, as shown in the illustration, was backed up to the edge of the incline and as a precaution was guyed, although it was found afterwards to have been unnecessary. Slings were placed about the machine and the boom of the wagon lowered. After all the ropes were made fast the winch was operated by the gang as shown in one of the photographs and the machine lifted up the incline and placed right side up on the street level. The entire job consumed some twenty minutes.



Construction Details of the Winch.

The machine was practically uninjured, as only the two front fenders were bent and one door was broken.

There is quite a demand for blue prints and specifications of this machine by telephone men who are desirous of duplicating the equipment. Mr. Ebersole, to meet this demand, is selling blue prints and specifications at a reasonable price to other telephone men.

Want One System in Los Angeles.

A unanimous vote in favor of one telephone system for Los Angeles has been cast by the directors of the American Merchants' Syndicate. Business men who attended the meeting are planning to start a movement which will bring together an association of telephone subscribers.

The advisability of one telephone system will then be put to the vote of each subscriber, on the basis of one vote for each telephone used by the voter. Each subscriber who joins the association must agree to stand with the majority after the votes are counted.

The plan is then to take up with the city the merging of the two telephone companies into one system.

High Tension Lines in California.

The Pacific Telephone & Telegraph Co. has filed a petition with the State Railway Commission asking that body to prevent the erection of high tension wires beside its telephone wires. The telephone company asks the commission to prevent the Great Western Power Co. from erecting its high-voltage lines along the county road from Napa to Vallejo, complaining that the high power is transferred by induction to the telephone wires, rendering them useless and so highly charging them with electricity as to render the instruments dangerous to users.

This trouble has been encountered in several places where the telephone and power wires are close together. The effect has been to disorganize the telephone service. The Pacific company asks that the Great Western be made to erect its power lines at least 1,900 feet distant from the telephone wires.

The Railroad Commission is investigating the whole question and will soon make a ruling. The telephone company has its poles along county roads all over the state and, as a general thing, was first upon the ground. The power companies are now getting parallel franchises.

Should the commission rule that high-tension wires and telephone lines must be 1,900 feet apart, the company losing out will have to get private rights of way across the country.

California Company Absorbs Part of Pacific Bell.

The California Railroad Commission has granted the application of the Pomona Valley Telephone & Telegraph Union and the Pacific Telephone & Telegraph Co., permitting the latter to abandon the field to the Pomona company. The decision carries approval of an arrangement for interchange of switching between the two companies. The Pomona company will furnish the local service and the Pacific company the long distance.

Those sections of the contract of which the commission did not approve provide for a division of revenues, for a restriction of the Pomona company under a $50,000 penalty to the use of the Pacific's or the United States Long Distance Company's toll service and for the prior right of the Pacific to purchase the Pomona plant.

The Reedley Telephone Co. has applied for permission to advance rates in one section from twenty-five cents to fifty cents a month, and in another section from $3 to $3.60.

New York Commission Refuses Consent to Merger.

Owing to a prospect of increased rates the New York Public Service Commission has denied the application to consolidate Independent and Bell telephone companies in northern New York.

The members of the commission made no objection to some of the purposes proposed in the merger, such as elimination of duplication, improvements in the service and the amount of securities to be issued. These are all held to be satisfactory, but the commission felt it could not become a party in the movement to increase rates which the commission declared inevitable after an examination of the conditions in at least eight exchanges.

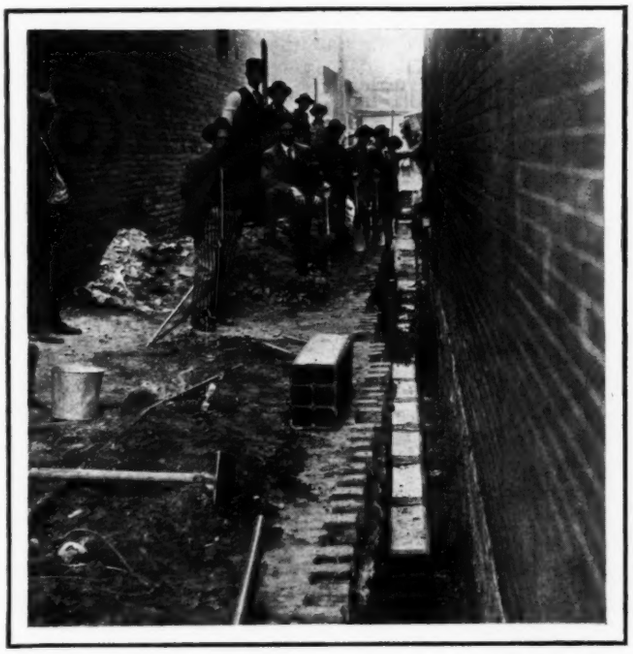
The principal competing exchanges are located in Plattsburgh, Dannemora, Saranac Lake, Chateaugay, Norwood, Potsdam, and Canton, all in or adjacent to the Adirondack region. The Adirondack Home Telephone Co. and the Mountain Home Telephone Co. are the two principal Independent companies whose merger with the New York Telephone Co. has thus been halted by the commission.

Memphis Rate Ordinance Tied Up.

Judge John E. McCall has granted a restraining order prohibiting the city of Memphis, Tenn., from attempting to enforce the ordinance recently adopted which had in view the regulation of rates of the Cumberland Telephone & Telegraph Co. in Memphis.

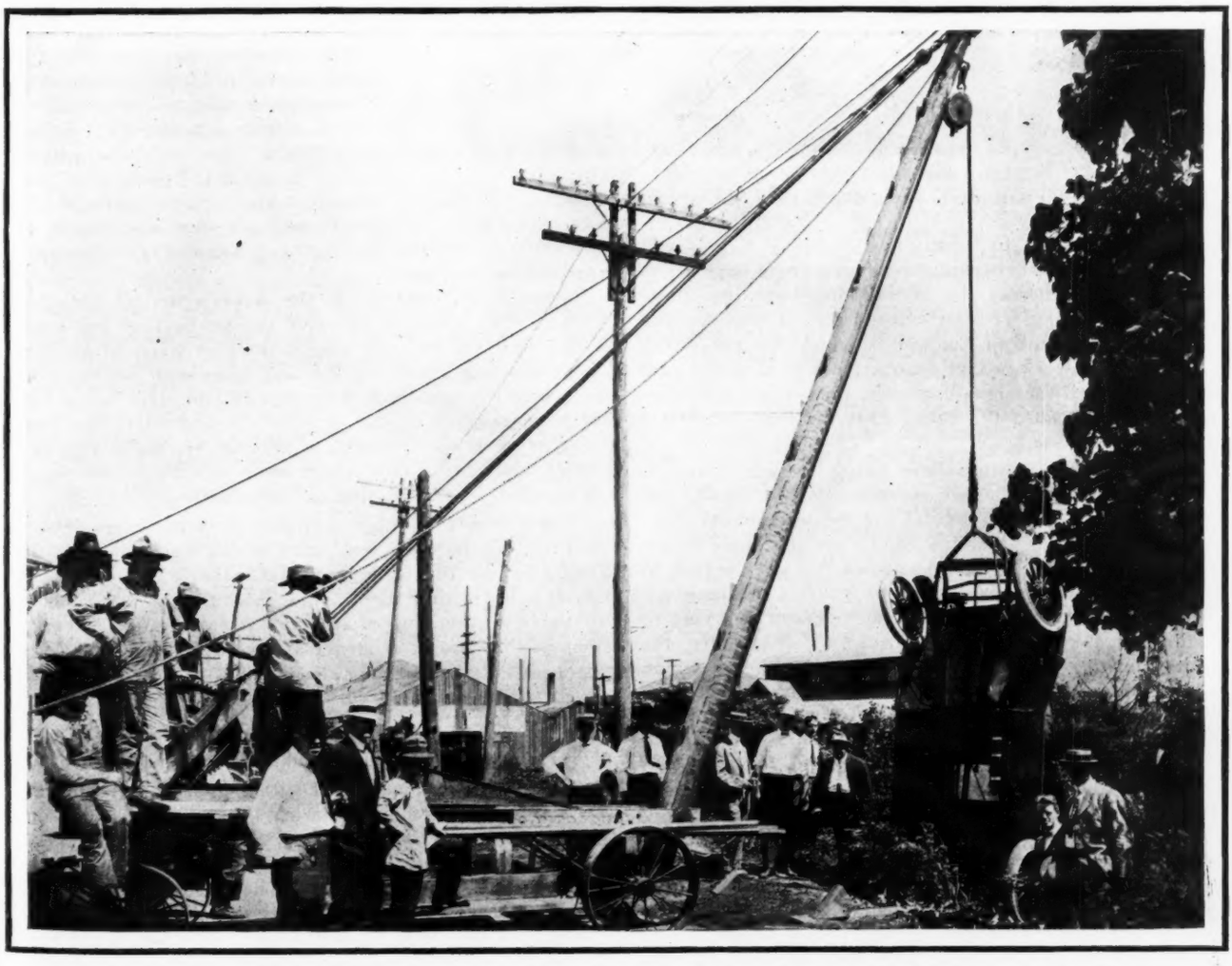
The effect of the restraining order is to permit the rates and charges made prior to the passage of the ordinance to continue. A bond has been filed by the company to guarantee the subscribers who pay the old rates that they will be refunded the excess amount collected.

Some Interesting Photographs from the Construction Field



In Crawfordsville, Indiana, Conduit Was Laid Along the Sides of Buildings to Avoid Obstructions in Center of Alleys.

Frank Ebersole's Pole Gin Wagon Recently Removed an Overturned Automobile from a 30 ft. Ravine in Houston, Texas.



The Gin Wagon Used for Other Purposes than Erecting Poles—It Rescued the Automobile in Twenty Minutes.

Best Operators' "School" Yet Held in Michigan.

The best operators' meeting ever held in Michigan was recently conducted under the supervision of W. S. Vivian, secretary and treasurer of the Michigan Independent Telephone & Traffic Assn., Grand Rapids, in that city. There were about one hundred operators in from outside of Grand Rapids, covering quite a large territory, from Cadillac and Traverse City on the north, Saginaw and Bay City to the east, Jackson, Battle Creek and Marshall to the south, and Chicago from across the lake.

"The discussion on the part of the operators present exceeded anything we have ever hitherto experienced in a meeting of this kind," says Mr. Vivian. "The girls brought up problem after problem that they were having in their local offices in the actual transaction of their work.

"One thing that is being brought out more and more in the schools is the fact that the operators in any office appear to have very little faith or confidence in the operators at adjacent offices. This is evidenced by the fact that if an office signals and fails to get an immediate reply, it immediately signals again, regardless of the time that should be allowed. This frequently means that anywhere from a half a dozen to twenty-five or thirty signals will be sent along the circuit within a minute, or perhaps a less period of time, whereas the instructions state that there should be a delay of at least fifteen seconds between signals. Therefore, one of the points which we are trying to make in this work is that all operators in all offices are busy; and that, if the signalling office fails to get a prompt reply, it was because the other operator was very busy with something else.

Some of the Attendants at the Big "School" at Grand Rapids, Mich.

"This being the case, it should wait a reasonable length of time for an answer before signalling again. If the signals come in rapidly, the chances are the terminating operator or the operator signalled would get the rings in the ear. As a result the relation between the girls would be strained before they ever started to transact business.

"Again we often find that when an operator is trying to get through a switching office for some other office, the circuit from the switching point is busy and the switching operator passes an N. C. report to the calling office. The calling office then requests the switching office to call, which the operator agrees to do, and is expected to do according to the rules of the Michigan Independent Telephone & Traffic Assn. These rules state that in a case of this kind, the switching operator becomes entirely responsible for the completion of the ticket. Therefore, we ask the originating operator not to call the switching office again for a period of fifteen minutes. We ask the switching office to call the originating operator within the fifteen minutes and make a report on the ticket, regardless of whether the circuit is busy or not. Still we find that this suspicion which the originating operator has against the switching operator causes her to ring back within two or three minutes, or perhaps within fifteen minutes she would ring her a half a dozen times, for the circuit she desires, thus increasing her work and the work of the switching operator, which naturally delays the progress of the messages as a whole all over the system.

"We are urging our operators to observe these instructions, and to put them into actual practice day by day as they work at the boards. In emphasizing these weaknesses in our work at the schools which we are holding, the operators have the opportunity to become acquainted with these same girls of whom they have always had a suspicion, so far as their work was concerned, and when they see that they are girls of average intelligence and general appearance like themselves, they see the folly of such a procedure. The tendency then is, as they go back to their respective boards, to make them more liable to put these things into practice. At any rate there will not be the disputing going on between operators over the circuits that there was before."

Mr. Smith, traffic manager of the Citizens' Telephone Co., had chartered a car from the street railway company and after the business session throughout the afternoon, everybody was entertained at a picnic supper on the steamer Major Watson, at Reeds Lake. At 8 o'clock the Citizens company entertained the party at the Ramona Theater, where a good vaudeville program was on.

The following day some of the chief operators from neighboring cities stayed over and were entertained with automobile rides around the city, and other diversions. The girls themselves expressed their appreciation of the work and pleasure by saying as they left for their homes that they had the best time they ever had in their lives.

"There is no question in the writer's mind," adds Mr. Vivian, "that when an operator can go back to her home feeling that she has had one of the best times in her life, at the company's expense, she also takes with her the more important thought that the company considers her a part of the organization, that it feels she is human, the same as others, and she is bound to take up her work with new energy and enthusiasm contributing directly to the financial benefit of the companies participating."

Throughout the entire business session three demonstrating switchboards were used which were given to the association by the Kellogg Switchboard & Supply Co., of Chicago, some time ago. These boards are very valuable in enabling the giving of an actual demonstration of conditions as they are in existence at the several offices. When an operator takes her position at one of these boards her actual work is reproduced.

Physical Connection Demanded in Washington.

A complaint has been filed with the Washington Public Service Commission by the Farmers' Independent Telephone Co., of Douglas County, against the Pacific Telephone & Telegraph Co., demanding a hearing in the matter of physical connection at Waterville. The Independent company operates 250 miles of line and has about 225 subscribers.

The lines radiate in all directions in Douglas county from Waterville, where it maintains an exchange.

Some New Light

The Potal Matter—Some Correspondence

By J. C. Kelsey

I seem to have my foot in it. It seems impossible to run a column which will please everyone. How queer!

I have had a little to say about the Postal Telegraph Co. And I said it more in sorrow than in anger, because I value the Postal and appreciate its difficulties.

When I heard so much about its entrance into the telephone field I was certainly interested. And I anticipated great and pleasing things.

As time went on, nothing seemed to be happening. Finally, I commenced to hear about some questionable things. I tried to communicate with some Postal Telegraph Co. officials, but have never had the courtesy of a reply. I suppose it is the custom of great corporations to ignore protests of ordinary individuals.

Anyway, I started out to find if there was any justification. It may be that our correspondent never heard of a periodical reciting the details of one side of a dispute. I am not aware that such an action requires any precedent.

There is plenty of chance for the Postal to enter the columns of TELEPHONY. That is exactly what I want it to do! Every reader has that right.

I am old enough to know that there are two sides to everything. But when you can get but one side, and meet with contemptuous silence on the other side, there is nothing else to do but to give the side you can get.

I have never deliberately tried to be unfair to anyone. When I started this column in TELEPHONY, I knew I was entering into a troublesome thing. One has to speak plainly—and call a spade a spade.

I have had my share of misgivings about the propriety of certain acts, but have always stood by to await the consequences. I am still standing by.

The funny part of a column such as I run, is the eagerness of certain people to have you say things for them. They ask you to do questionable things, but they don't want their names used.

You remember I had a story on "Let George Do It." I have pulled the last chestnut out of the fire! I intend to go right on questioning the professions of our alleged friends of Independent, or open field, telephony.

I am glad to hear from the Postal. I have always gone out of my way to boost its game. And I think its refusal to come into the telephone field is one of our greatest disappointments.

I want you to read the following letter. It protests vigorously against the way I handled the Spokane-Seattle conditions. And it is possible that I made a mistake in giving such full credence to the one side of the story. But it was all the information I had.

Publicity is talked of considerably these days, as a general panacea. I wanted my readers to understand the mysterious ways of the Postal telephone invasion. I am not sorry for anything. But I do want to make the plea that neither TELEPHONY nor myself willingly do any institution injustice.

Things done in self-defense are usually deemed justifiable. Anyway, read the letter:

TELEPHONY, Chicago.

Gentlemen: Answering your letter of the 24th instant, would say the point I had in mind was that it was unfair to the Postal company to single out a transaction in which there was a dispute as to conditions and use it against them without knowing their side of the case.

I have had little experience in publicity, but I can not remember of ever hearing of a periodical reciting the details of one side of a dispute and displaying so much animus as was displayed in this article, and with no knowledge of the other side of the question.

Of course there is no chance for the Postal to go into your columns in answering this statement of Kelsey. It would be foolish for them to do so.

I suppose I was foolish to call your attention to this matter, but I had your interests more in mind than a desire to make myself ridiculous by protesting against your methods of publicity.

Very truly yours,

The writer is dead wrong. There is a big chance for the Postal, or anyone, to go into TELEPHONY. But when they *refuse* to go into TELEPHONY, it makes a difference.

It makes me laugh when a man intimates that he makes himself ridiculous by protesting against any publicity matter. I have heard so often that no one dared to answer me, because I held the fort. That is absurd!

Here is another letter from the same man:

TELEPHONY, Chicago.

Gentlemen: I am sending you herewith, letter from E. J. Nally, vice-president and general manager of the Postal Telegraph-Cable Co., giving detailed explanation of the controversy between the Postal company and Interstate Consolidated Telephone Co., of Spokane.

The Kelsey article, which laid great stress on the Postal going into the telephone business itself to the detriment of the Independents, you will note, was clearly a mis-statement of facts. I think you have done the Postal a very serious injustice in the Kelsey article, and believe you will agree with me on this point after you have read this letter carefully.

I agree with you that the Postal company has done itself a very considerable loss in ignoring the advantages which it might have gained through hearty cooperation with Independent companies, but its policy along these lines has been fully exploited, and it seems to me it should not be criticised in the one-sided way in which Kelsey criticised it in a recent issue of your paper.

Mr. Nally gives me permission to use this information in any way I see fit, but if you desire to correct the statements made, I wish you would do so by a short, concise statement to the effect that you find Mr. Kelsey was in error as to the situation in this particular controversy, and that the Postal only offered service to the public on its own accord after it had been invited to do so by the Interstate Consolidated Telephone Co. If you do not wish to make that explanation, then I think it would be well to just let the matter rest as it is.

Please be assured that my interest in the matter is simply a friendly one in behalf of TELEPHONY, as well as the Postal Telegraph-Cable Co.

Very truly yours,

The Postal letter was not addressed to me, so I will not give it verbatim. But I will use parts of it to show that there is a dispute.

You know, in commercial circles, that a disputed account can not be listed against a buyer. It would be unjust to the buyer, and place a great advantage at the disposal of the seller.

Regarding the second letter, it is news to me that the Postal policy has been fully exploited. My mail has been full of questions regarding this matter. It is a very important one, too.

I can't say that I was in error regarding that article. I received a letter from an Independent telephone man and he was courageous enough to sign his own name. You don't know how much I admire a man who is willing to sign his name to a statement.

TELEPHONY stands as a protector of Independent interests, as far as publicity is concerned. I certainly do not think that I made an error in commenting upon a signed letter.

Right or wrong, the man who has the courage to come out in the open is the progressive party.

In looking over the letter from the Postal company, there is a dispute. There might also be one in the Sydney Whyte matter, at Kosciusko, Miss. But so far we have heard nothing.

Of course, these things are not important. To my mind, contemptuous silence is a joke.

I have had experience enough to know what hurts, and where to hurt. I know that publicity is a preventative that has no superior. And as long as that publicity is one-sided, who is to blame?

It seems that the Spokane company made application to the Postal for the use of their lines between Seattle and Spokane. This was in the beginning of 1911.

Surely, it was the logical thing to do.

To get Portland and Tacoma service, that of the Northwestern Long Distance service, it was necessary for the Postal to string two No. 9 copper wires from Seattle to Kent. This it agreed to do. Here the row begins!

The Postal did not receive remittances beginning June 1. Spokane refused, on the ground that the Kent connection had not been made.

The Postal refused to go ahead with the Kent construction until the Spokane-Seattle bill was paid. Spokane then promised to pay after September 1, as the lines had presumably been in bad order. This satisfied the Postal, and it went ahead with the Kent matter.

Thus, eleven weary months were wasted—mostly disputes over the condition of the circuits. After the Postal had completed the Kent line, it was found that there were no wires between Kent and Tacoma! More delay! Finally a complete connection.

A 150-ohm telegraph relay, cut in on one of the coppers, contributed further to the good(?) feeling between the companies. It was the old story—it was always the other fellow's fault.

When the operator kicks on the swtichboard, the manufacturer thinks his lines are bad. One company sells the local board, another company the toll board, transmission is bad—the other fellow is always to blame.

The Postal employes were sure they were all right. The Spokane telephone employes were equally sure they were correct. There is an awful lot of human nature in this case.

The Postal employes on the coast would not admit their work was defective. And the officials necessarily had to take their word for it.

Finally, on December 17, the Spokane and Seattle telephone officials had a good conversation, "100 per cent. better than the Bell circuit." Then the Postal asked for payment for services from June 1, to December 31, 1911, amounting to $1,814.22. The Spokane interests met this by terminating the contract.

> Paragraph 4 (of the contract) said that their "agreement shall be and continue in force from month to month only—and is terminable at the end of any month on 30 days' previous written notice by either party, to the other party. This is to notify you that we desire to terminate the above contract."

The Spokane telephone interests further offered their exchange for terminal purposes to the Postal, on commission. And the letter from Vice-President Nally winds up:

> The above statement of facts clearly shows that we did not take the circuit away from him (President Lane) until he had served notice on us discontinuing the agreement. And you will see, too, that it was his own suggestion that we operate the telephone circuit ourselves, he offering to make connections on a commission basis, which we declined.

Thus we have the whole story. I wish I could give you the letter direct, but it was not addressed to me. As a matter of fact, the whole deal started wrong. And of course it finished that way.

It is practically impossible for two such concerns to agree. So I guess it is better that things stand as they are.

I really am not sorry I broke into it. How else could you understand the various conditions of your business, without hearing of others' experiences? I am still hard-hearted. I can't see where I have erred, unless it is for mentioning the name of the Postal Telegraph Co. Nothing is sacred to me when it involves additional information or experience to the telephone business. If I sat back and wrote grave and learned discussions, offending no one, you would soon have a bigger kick.

I was asked to go into this fight for Independent telephony, nearly three years ago. And I was urged by a very formidable bunch of fighters at that time, too. I am still at it, although I don't see as much fighting about me as formerly.

But if I find I am merely a Don Quixote, vainly fighting windmills, and my readers are laughing behind my back, I will be tempted to quit.

The whole question resolves itself into this—and it is about the only thing I agree with as regards the biggest bull moose of them all: Shall I throw my hat in the ring and hunt trouble, or slink around making trouble for other people without telling them? Or worse, introduce a pretty golden rule into the game and love my enemies?

How long would you be interested in a "mollycoddle" column? One issue only.

I have no grievance against the Postal—I only had hopes. Today I confess that I am glad things have turned out as they have. Whatever is, is right, I guess!

I am sorry I could not be honored with a communication from the Postal. Maybe, if I am ambitious and persistent, it may yet answer a letter. I am sincerely glad that it did not accept my story in silence. It has defended itself nicely. I call the whole controversy a draw!

TELEPHONY does not attempt to speak authoritatively on every subject. No periodical can do that. Without the theory of fire existing where there is smoke, no newspaper on earth could exist.

TELEPHONY only reserves the right to inquire into professed friendships and analyze their actions, as well as their effect on Independent or open-field telephony.

We all know that we have been through an unparalleled battle. The Bell company made the original mistake of belittling and misrepresenting Independent telephony. And we, possibly, made a mistake in answering back.

We have gone out of our way to hunt trouble. I hope we have reason to stop before it becomes a habit.

MORAL: A word in time save: nine!

Michigan's Standard Operating Rules and Suggestions

Rules Governing the Handling of Long Distance Traffic of the Independent Telephone Companies of Michigan
Prepared and Compiled by W. S. Vivian, of the Michigan Independent Telephone & Traffic Association, Assisted by J. T. Belanger, H. T. Clough and G. F. Stratemeyer

The business of a public utility, such as a telephone company represents, is to furnish the public efficient and satisfactory telephone communication. To this end the Independent telephone companies of Michigan operate and maintain an extensive and costly plant embodying all the facilities known to the telephone art, to render communication possible and easy.

The operating employes are depended upon to ascertain the patrons' requirements, fulfill them satisfactorily and make the service attractive, thus insuring stability and growth of the business. To assist and direct its members, the companies provide operating instructions describing in detail the procedure which shall be followed in performing the work.

It is therefore the first duty of employes to familiarize themselves with every detail of the instructions relating to their work and to observe them in spirit and letter at all times. It is not possible, however, to cover every act of an employe by rule. Much must be left to good judgment and discretion, and employes are held responsible for the exercise of these qualities as much as for the observance of the written rules.

The mere observance of rules, furthermore will not secure the desired results. The spirit and manner in which the work is performed are primary elements of success. Employes are expected to realize this and conduct themselves accordingly. Satisfactory results will invariably be secured if each employe performs his work with enthusiasm and constantly keeps in mind the following requisites of good service.

Courtesy vs. Discourtesy.

Courtesy is something which the public has a right to expect. It makes work easy and pleasant, encourages the use of the service, and is profitable alike to the employe and to the company. Discourtesy wastes time, creates difficulties and causes dissatisfaction. In telephone communication, impressions are formed entirely from what is said and the manner of saying it. Under such circumstances, a courteous tone of voice and manner of expression are even more necessary than in other personal dealings. The principle underlying courtesy is simply that of doing unto others as you would have them do unto you.

The satisfactory completion of a telephone call requires the co-operation of several persons. The failure of one employe to perform properly his part of the work reacts seriously on the efforts of others. Successful service is, therefore, impossible unless the fullest spirit of team work prevails. *Co-operation between employes, wherever located, with respect to each other, is essential for the proper handling of the service.*

Requests and orders from other employes shall be complied with promptly and willingly. If there is reason to question a request or order received, it shall be referred immediately to a superior. An employe shall not delay or refuse to comply with a request or order unless previously instructed to do so. Calls must not be delayed due to disputes between employes.

The most effective co-operation which an employe can give to another is proper performance of his own work. Employes are dependent upon each other and inefficiency or poor work on the part of one employe reacts seriously on others and on the service. The service will be good or bad according to the speed and precision of the team work between the employes concerned.

Mistakes are usually caused by carelessness. They result in failure to give the service demanded, the aggravation of the patron, wasted work on the part of the employe, and unnecessary expense to the company, all of which may be avoided by reasonable care.

Facilities are furnished by the company to give prompt service, under normal conditions, at all times. In order that the results contemplated may be secured, however, it is essential that each employe perform each step in his work with all possible dispatch. Speed is not mere haste, but is the quiet orderly performance of each act without loss of time and with the least possible expenditure of energy. Consistency in speed of service is most desirable. One case of slow service offsets the good impression created by many cases of rapid service. All dealings with patrons and other employes should be conducted without waste of time and in a brisk, businesslike manner.

The Manager and His Duties.

The business of manufacturing telephone service, creating a demand for the product and finally delivering the goods and collecting for their manufacture and delivery has put a large number of men into the field, who are styled telephone managers. It is universally conceded that the hardest product to handle is public service of any character, but of the several varieties, that of telephone service occupies a place all its own.

The public knows less of the methods and requirements to manufacture telephone service than of most any other business. When we consider the business from this standpoint, it is at once apparent that the opportunities before the average telephone manager are legion; that if he fulfills his duties and makes the most of his opportunities, he must put himself in touch with his business by study and painstaking application.

For the man who wishes to put himself in harmony with his calling and render for his employers and the public he serves, the best service, the rules and suggestions herewith have been compiled. To that man they will be helpful.

The purpose of the Michigan Independent Telephone & Traffic Association is to assist in upbuilding the Independent telephone business; it seeks by the aid of suggestions and rules, to establish a system which will give uniformity of practice and make for better conditions in the interchange of hundreds of thousands of messages each year.

The successful manager is the man who can adapt himself to the conditions he finds; hold himself to the course prescribed by his superiors, and has the determination to keep steadily to the front of his assistants and be the leader. For that kind of man, there are no failures, for he is constantly making successes of apparent impossibilities.

Success in any calling cannot be obtained by mechanical means, hence the first and most necessary rule for any manager to follow is a close and systematic study of his own local surroundings; then fit the general rule of the business to his needs and conditions. He must know himself, his trade and its needs, and his help. He should be ready to solicit, consider and give credit for each and every suggestion from superior, subordinate or the public.

The theory underlying these rules is that the business cannot reach the acme of success without a system. That fact should become firmly implanted in the mind of every manager, and through him to every subordinate.

The entire fabric of the telephone business is woven from little things. The local charge for service is small, the charge for communication between distant points, still smaller. The product of the several companies is made up of these innumerable small items. Every company is dependent for its success upon the efforts of all other companies. This fact is the strongest argument for the need of a universal system, in which all have confidence and which all are consistently working to carry out.

When this fact is thoroughly understood by every manager, few rules for conduct will be necessary. A thorough knowledge on his part of the several rules of the system, will con-

vince him of their value. The inevitable infraction of the rules by employes from time to time, will convince him of their practicability when properly enforced and put him in tune with the plan to build for and help one another, as the best means to build for himself.

Finally, the manager must be in intimate touch with every department of his system or exchange, and this can only be accomplished by close application to business. He must be in perfect harmony with every subordinate and employe and yet see that each does his duty. This cannot be accomplished by neglecting his own duties. He must be in intimate touch with every other business interest in his community. This cannot be accomplished except by frequent visits to his trade, like any other salesman, and by his attitude and work constantly impress upon the minds of the public, that their interest is his first and foremost business.

A Manager's Duties Are Diversified.

The duties of the interested manager are so diversified that he should be constantly in touch with his system and patrons, no matter where he may be. This can best be accomplished by the aid of a competent chief operator. For that reason, every manager, no matter how small his plant, shall appoint his most competent operator to fulfill these duties, and keep her constantly in touch, through the rules laid down in this system and others of local use that he may devise, with every feature of his work.

He should inculcate a feeling of responsibility and constantly encourage a desire on the part of his chief operator to carry her part of the burdens of the office. He should explain all features of the work in which she is likely to have any part and assist her in every way to become an efficient helper. He should teach his chief operator and through her all other operators, to look upon the business as a whole.

All tariffs, tariff books, rules of operating and instructions for routing, pertaining to the long distance traffic of the state, shall be issued through the Michigan Independent Telephone & Traffic Association. It shall be the duty of the manager to see that his office is supplied with tariff books.

The manager shall report to his general office, all new or discontinued toll stations, new circuits, offices closed, or changes in checking stations, in his territory. This information must be sent as soon as changes are made, in order that general instructions may be corrected. If the manager requires information not contained in the tariff book, whether applying to Michigan or other states, relative to rates or routing, he shall request same from his general office. Change in rates or routing shall not be made except upon due authority. Bulletins will be issued from time to time as may be necessary to cover all changes in tariffs or instructions. The manager shall see that instructions in bulletins are at once posted in the tariff book. The last instructions contained in bulletins shall supersede all previous instructions conflicting therewith. The manager shall see that all differences in rates are promptly reported to his general office, unless otherwise instructed.

He shall closely observe routings used by operators to determine if same are correct, and if not, arrange through the chief operator to properly instruct long distance operators. He shall see that every long distance message passing in, out, or through his office is checked and recorded, except calls made by chief operators, wire chiefs, or troublemen when testing circuits.

He shall see that all transactions of company business by employes is handled through correspondence, unless absolutely necessary to use long distance circuits. All use of circuits for company business must be settled through the accounting department. He shall see that an accurate clock is placed in operating room, convenient to the operating force.

He shall see that operators are provided with copies of standard rules, and that they thoroughly understand and carefully observe them. He shall provide a competent operating force at all times. He shall see that substitute long distance operators are trained to take the place of regular long distance operators in case of absence. He shall pay special attention to the voice when engaging operators.

He shall see that every possible effort is made to revive lost calls. He shall see that long distance circuits are properly distributed on long distance boards so that best possible operating results are obtained.

He shall see that all reports of long distance trouble are turned over to himself or his troubleman not later than 7:15 a. m. daily.

As soon as trouble on long distance circuits is reported, the manager, wire chief or troubleman must immediately have proper tests made to determine as nearly as possible the nature and location of trouble.

He shall see that all equipment or circuit trouble is promptly reported to and tested by wire chief.

He shall see that long distance trouble is cleared immediately and given preference over local trouble.

He shall see that all long distance trouble outside of his jurisdiction is immediately reported to the manager in whose territory trouble appears.

He shall personally make test calls on long distance circuits within his jurisdiction to see that there is no deficiency in transmission.

He shall see that the insulation on long distance pole lines is properly maintained and that all tree leakage, etc., is cleared by trimming of trees, or if work of this nature is not within his jurisdiction, that same is promptly reported to the proper office.

He shall see that his troublemen are properly instructed in testing on long distance circuits and that they are properly equipped with necessary tools and material when sent on a case of trouble. He shall see that troublemen are not allowed to do temporary work.

He shall see that all long distance circuits are properly protected by fuse and carbon lightning arresters in his office, and that carbons are properly cleaned after each electrical storm. He shall see that signaling equipment on both long distance circuits and switchboard cords are always kept in first-class order.

He shall see that Log Book is properly kept. He shall instill into the minds of his force that rules are made to be enforced.

Chief Operators and Their Duties.

The chief operator should be ever ready to assume responsibility and in the absence of her manager, care for every contingency that arises, to the best of her ability, ever remembering that the person who never makes mistakes, never accomplishes anything.

The company's first obligation is to render satisfactory service to its patrons. The number of complaints received indicates how well or how poorly it is discharging this obligation. Each complaint is an indication of something wrong, and shall be viewed as a means of locating and eliminating a condition which might otherwise become a continued cause of dissatisfaction.

Much depends upon the manner in which a complaint is received. Patrons seldom complain without cause, and in receiving a complaint, it shall be assumed that the patron has experienced the trouble complained of or some trouble which he may be unable to describe accurately. The recipient of a complaint must always bear this in mind, and accord a complainant courteous treatment, evincing the interest in the case which the patron has a right to expect, and which the company expects of its employes. In the case of an oral complaint, the patron shall be assured by the words and manner of the recipient, that his complaint will receive immediate attention and thorough investigation. A letter complaint shall be promptly acknowledged either by personal interview or in

writing, appreciation being expressed for bringing the trouble to the company's attention. Prompt and effective investigation shall be assured.

The investigation must bear out this assurance in fact, and every effort must be made to locate and remove the cause of the trouble, for only by this means can a recurrence be avoided.

Duties of the Chief Operator.

Every complaint shall be promptly disposed of, and every reasonable effort made to adjust the matter to the satisfaction of the patron. If it is not promptly adjusted, the patron may regard it as an evidence of indifference on the part of the company; be confirmed in his impression that the service is unsatisfactory, and conclude that it is due to lax methods on the part of the company. Such an impression would discourage his use of the service. On the other hand, if it is investigated thoroughly and adjusted promptly and judiciously, the patron's confidence in the character of the company's service may be increased. Often a patron becomes either a friend or an enemy of the company by reason of the manner in which a complaint is received and disposed of.

A similar attitude shall be taken regarding complaints of service received from another station, and responsibility shall never be evaded.

The company will not tolerate indifference toward compiaints or complainants.

The chief operator is expected to keep the number of complaints at a minimum, to discuss those that are received with her assistants, and if necessary, with the entire force. She should endeavor by all means at her command, to prevent recurrence of any trouble of which complaint has been made. She should criticise helpfully the work of her assistants and make constant effort to interest and encourage them in their work.

She must keep her manager closely informed of every feature of the work and every incident of service or criticism, either favorable or otherwise. Remember an intelligent complaint is one of the most valuable assets a company can have, because it at once points out a feature that should be remedied.

She should encourage her operators to report to her criticisms of the service. She shall be responsible to the manager for the deportment and discipline of her operators while on duty. She should remember that reports of her office and force are necessary for the good of the entire system, and that they do not necessarily reflect discredit upon her or her office. With this thought in mind, it is as much her duty to report infractions of rules, mistakes, and other matters that have a tendency to harm the service, which originate in other offices, as though they were found in her own office.

She should accept any criticism received as an honest and sincere opinion of the service as it appears to those making the complaint, and should investigate all such criticisms impartially, taking immediate steps to correct the cause, and when required, giving proper explanation to the person making the complaint.

She must be punctual to her duties and by her own actions and demeanor, encourage and demand from her subordinates the respect and consideration that her position demands. She should constantly remember that she occupies a place of trust, and that her own and neighboring employers place in her hands daily, vast systems that have cost large sums of money; that their proper use means credit to herself and profit to her employers and that an improper use means loss and discredit.

She should ever bear in mind that she and the office she represents is a part of a vast system, and that when her part is not doing its best, it impairs the value of every other part. She must be thoroughly posted in both the letter and the spirit of the rules and regulations and know reason for each.

The chief operator must remember that her first duty lies in furnishing efficient service and that every rule laid down for her guidance is designed to give the public what they are paying for, namely: the best possible service.

She shall see that competent operators are assigned to the handling of long distance circuits. She shall see that a proper schedule of operators is arranged, so that the boards are sufficiently covered at all times. She shall see that each operator is provided with a set of operating rules, and that the instructions therein are closely followed. She shall see that all of her operators are properly instructed as to the use of long distance circuits with relation to tariff, routing, etc.

Further Demands Upon Chief Operator.

She shall see that each of her operators are provided with an identifying number to be used on all tickets, as that operator's signature. She shall see that operators are familiar with and thoroughly understand, the use of the code. She shall see that operators are familiar with pay station signals.

She shall see that operators test all switchboard equipment, such as cords, supervisory signals, service trunks, etc., daily, to insure their working correctly.

She shall see that, where the same operators handle local as well as long distance calls, the long distance calls are given preference over the local.

Where practicable, certain operators should be designated as "Recording Operators," whose duty it shall be to receive and record all tickets offered.

The chief operator should use every effort to create and maintain harmony between her force and the force of every other office; and to see that they are courteous and obliging with each other. Under no circumstances should she tolerate or permit any bickering or quarreling between operators of her office or with other offices. She must see to it that the distant office always has help and service ahead of her own office, for she never knows at what moment the success of her own efforts may depend upon the help of some other office.

She shall see that tickets are gone over and any omissions added and that corrections are made, where necessary, each day, so that they may be correct in every detail before being posted to check ledger. She shall make changes in time or charges on messages, subject to the approval of manager.

She shall see that proper information is recorded on back of all tickets. She shall take up delayed tickets with the chief operator at point of delay. She shall see that every possible effort is made to complete "D. A." (Do not answer) tickets.

Any ticket that is not completed by midnight of the day upon which ticket is filed, shall be considered as lost for that day. She shall examine, each morning, all lost and cancelled tickets of the day previous, and if possible, revive and complete same. The original unfinished ticket should be left in its place and notation made on same, showing date and time same was finished. The completed ticket would appear as a new ticket for the day on which it was completed.

She shall appoint an operator in her office, who shall, because of her peculiar fitness for the work, do all repeating necessary. In offices where practical, repeating shall be done by someone other than the line operators.

Service the Company's Stock in Trade.

Long distance service is the commodity telephone companies have to sell to the public and in comparison, is the same as the commodity or articles sold by any merchant or firm. Therefore, she should look upon each ticket with the same respect that she would a tangible piece of merchandise or an equal sum of money.

Our commodity—service—is sold for a specified amount for three minutes and an added amount for each additional minute of overtime, over the three minutes stipulated. All tariffs as quoted in tariff book are based on a three-minute conversation. Patrons should pay for full service at all times, but due allowance should be made for poor service, not the fault of patrons.

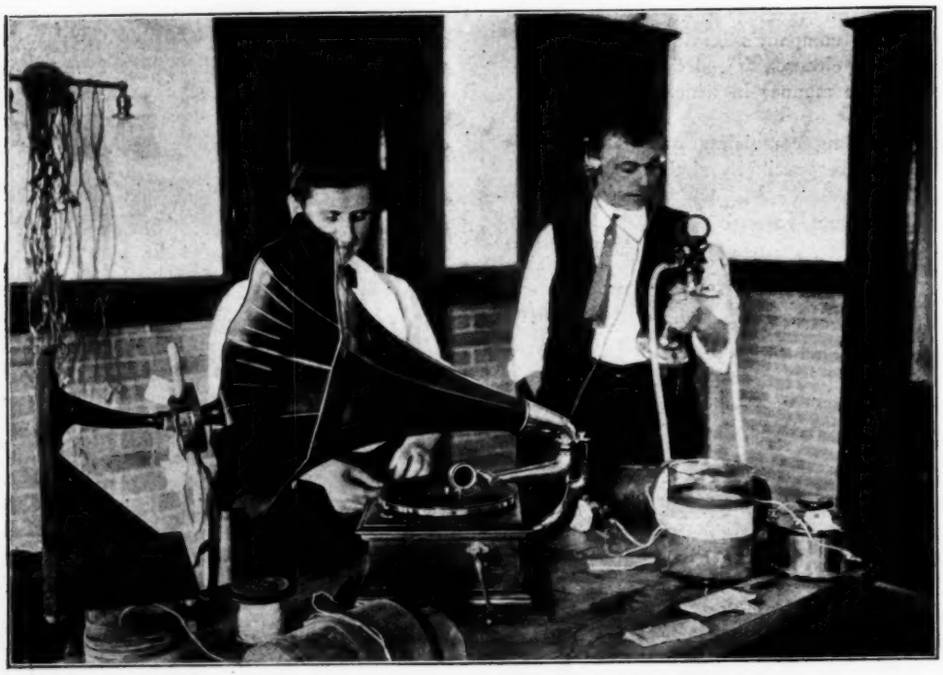
(*Continued on page 216.*)

Telephone as Aid to Talking Machine Sales.

Some dealers in graphophones and phonographs are now employing the telephone in a novel manner. They use it for the purpose of playing a record to a customer who is unable to come to the salesroom to hear it. The accompanying illustration, reproduced through the courtesy of the Inland Storekeeper, Chicago, shows how the trick is done. It is stated that many sales of records are accomplished by means of this method of demonstration, which is astonishingly simple, as well as effective.

Keystone Not to Lease Conduits.

A director of the Keystone Telephone Co., of Philadelphia, is quoted as saying: "There is absolutely no truth in the reports current recently that the Keystone company



Many Sales of Phonograph and Graphophone Records Are Made Over the Telephone.

is to lease its conduits to the Philadelphia Electric Co., and the rumor that New York interests were buying the company's stock is equally baseless. The movement in the company's shares is purely a stock market affair. Signatures to 45,000 shares of the common stock have already been obtained to the renewal of the voting trust and little or no trouble is anticipated in securing signatures to the 10,000 additional shares required to assure the renewal of the voting trust agreement. Many signatures are promised from holders who are now out of town and will delay signing until they return to the city."

Approves Revocation of Seattle Franchise.

Acting Mayor Robert B. Hesketh, of Seattle, Wash., has approved an ordinance passed by the city council revoking the franchise of the Independent Telephone Co., granted in 1901, to John S. McGroaty and George C. Blanker, and later assigned to the Independent Telephone Co., and by that company assigned to the Pacific Telephone & Telegraph Co.

By the same vote, the council favored instructing the board of public works to issue permits to the Pacific company to make physical connections in order to improve the service, with a stipulation contained in each permit protecting all interests the city may have in the property of the Independent Telephone Co. because of the revocation of the franchise grant.

Japanese First Foreign Language Over Telephone.

According to Dr. Alexander Graham Bell, the first foreign language transmitted by telephone was Japanese, recounts Popular Electricity. In telling about it recently he said:

In the early part of 1877 or the end of the year 1876, a rather interesting circumstance took place. I had among my students at Boston University a young Japanese student named Tsawa. He came to me for the purpose of studying the pronunciation of English. Of course, when he heard about the telephone he became very much interested. He said: "Mr. Bell, will this thing talk Japanese?" I said: "Certainly, any language." He seemed very much astonished at that, and said he would like to try it. I said that he could try it, and he went to one end of the circuit and I stood at the other. He talked Japanese, and I reported the result to him. He asked if it talked Japanese. I said: "It talked Japanese, but I couldn't quite understand it." He was not quite satisfied with that, and asked permission to bring some Japanese friends of his from Harvard College. I said: "Certainly." He brought two young men there, and they talked through the telephone and listened; so that Japanese was the first foreign language that was spoken over the telephone.

And these two Japanese gentlemen were exceptional men. I did not know who they were at the time, but years afterward it was revealed to me. I was in Japan, in Yokohama, when the American residents in Japan were giving a banquet to the new Japanese minister who was going to Washington, Mr. Kamura, now at the head of affairs in Japan. I was asked to attend the banquet, and instead of being introduced to Mr. Kamura, he came up to me and said: "I don't require an introduction to Mr. Bell. I knew him years ago." And he turned out to be one of the Japanese students.

Then I found out about the other one in a rather curious way. The Japanese government sent to this country at the time of the Russian-Japan war, Baron Kaneko. He came to Washington and gave a lecture before the National Geographic Society. I happened to be president of that society at the time. And so when the dinner was over and the time for speaking came, Baron Kaneko said: "I knew Mr. Bell years ago," and he told his story about the use of the telephone. So those two men, the foremost men in Japan today, Baron Kaneko and Mr. Kamura, were the two men who heard the telephone in the winter of 1876-1877.

Service Poor Since Merger at Syracuse.

The daily papers of Syracuse, N. Y., recount incidents showing that the telephone service in that city, since the merger of the Independent and Bell companies, has been steadily growing worse. Complaints, it is said, are multiplying daily.

New York Bell Lists Additional Bonds.

The New York Telephone Co. has made application to the New York Stock Exchange to list $10,000,000 first and general mortgage 4½ per cent. bonds.

A Discussion of Workmen's Compensation Act in Ohio

Details of Law Recently Enacted Which is Designed to Better Protect Both Employer and Employe in Case of Accident—Replaces Old "Master and Servant" Doctrine of Common Law Which Was Equitable to Neither—Will Probably Be Adopted Elsewhere

By B. O. Richey
Special Counsel, Dean Electric Co., Elyria, Ohio

Every employer of five or more workmen in the same business and every such employe, both within and without the state of Ohio, should be interested in "The Workmen's Compensation Act" which recently became a law in that state. Those without the state, because similar laws will sooner or later be enacted in every state in the Union. Such employers within the state are interested because they must elect to take advantage of this law and seek protection under it, or continue under their existing conditions; and such employes because they must be governed in such matters by the course of their employer. A close study of the law, its objects, its scope, its effect, the character of the employes and the temperament of juries is necessary to properly decide the better course for each individual employer and the course of workmen in selecting employment.

The objects sought to be effected by the law are economically and morally right. There can be no question that the old master and servant doctrine of the common law, formed when the master was supreme, was inadequate to meet the moral and sociological conditions, and that juries who have been moved by their sympathies have made what might be called "jury-made law" in their verdicts, contrary to the existing common law, while legislatures, in seeking to meet the requirements of the juries, have enacted statutes which have made it well nigh impossible for the employer to escape liability for accidents.

Defects of the Old Laws.

Such is the character of the "Norris Law," which became effective in Ohio in 1910, and which practically abolished the "fellow-servant" and "assumed risk" defenses and entirely abolished the defense of "contributory negligence."

The economic waste and the distress of the delays caused by the old common law and the procedures under the statutes are so great and so distressing as to be intolerable. First, there is the delay which takes place while the employe is injured and when he most needs relief and compensation. Then the expense and waste involved in court costs, lawyers' fees, the insurance fees paid by the employer, etc., must be borne by both parties to the contest, together with the ill-feeling between employer and employes engendered during a legal contest.

Moreover, many injuries which have been received and for which the employer cannot, under the law be held responsible, are nevertheless distressing, in that the injured workman and those dependent upon him are in need and suffer just as truly as if the injury had resulted from some act, the fault of the employer. It will be seen then that in endeavoring to divert this waste and loss to the workman, injured under any circumstances, except by his own wilful act, the objects of the law are highly altruistic.

To attain these objects the "Workmen's Compensation" proposes to abandon the previously existing laws relating to employers' liability as fixed by common law and the statute, and to substitue therefor a system of insurance securing for every workman injured in the course of his employment compensation based upon his earning and the character of his injury, which will relieve him and those dependent upon him during the period of his distress.

The general doctrine is not altogether new in America, laws having been passed in several states, some of which have endured and others of which have been declared unconstitutional. Abroad the doctrine is in quite general use, there being two systems in prominence. "The German Plan" involves the insurance feature. The employers and employes together create an insurance fund, which is administered through the state or some other agency equalizing losses due to injury in much the same way as losses by fire and other casualties.

Comparison of the Various Plans.

The "English Plan" prescribes certain compensation for injuries according to the character thereof, but requires each employer to compensate his employes for injuries sustained by them. Both plans have proven much superior to the common law and statute remedies. The "German Plan" has the advantage of equalizing the loss and the English, by throwing the loss directly upon the employer, of penalizing him for an accident, thus exciting a policy of care and caution. The Ohio law does both, in that premiums paid in are partly dependent upon the risks taken.

"The Workmen's Compensation Law," of Ohio, can be said to follow generally the "German Plan." Both employers and employes are to contribute to a general fund which is to be administered by a bureau, all expenses of which are paid by the state, so that practically every cent turned in is utilized for the relief of the injured workman.

The rates of premium are determined by the character of the employment and the degree of hazard, being based upon the total payroll and nature of employment. Of the premium thus assessed 90 per cent. is to be paid by the employer and 10 per cent. by the employe. The employer is authorized to deduct 10 per cent. of the premium from the wages of his employe for this purpose. This sum is, in most cases, ridiculously small.

These premiums are paid into the state treasury semi-annually and are there assembled to create a fund for the purposes prescribed.

The funds are disbursed by the state liability board of awards to the injured employes of those employers who have elected to take the law, no matter how the injury was received, unless self-inflicted. In addition to the award to the employe in the shape of a pension, the funds will be drawn on for medical, nurse and hospital services and for medicines and for other similar relief according to the discretion of the board.

Law Carefully Drawn to Prevent Fraud.

In case of death, reasonable funeral expenses will be allowed, which shall likewise be in addition to the award. Except for the first aid and funeral expenses just named, no award will be allowed for the first week after the injury is received. This rule prevails in practically all benevolent and benefit societies and aims to protect the state from pretended injuries of persons disposed to commit fraud.

In case of temporary or partial disability, the employe

shall receive 66⅔ per cent. of the impairment of his earning capacity during its continuance with a maximum of $12 a week and a minimum of $5 a week. If the employe's wages were less than $5 a week he will receive the full amount thereof. This award will continue for six years after the injury is received.

The act thus provides what amounts to a six-year pension for the injured. Practically no injuries short of permanent disability will incapacitate the employe for over six years, and if the nature of the injury incapacitates the workman in the particular trade in which he is skilled, the time is ample for him to learn a new trade.

In case of permanent total disability, he shall receive two-thirds his average weekly wages, with the same maximum and minimum, and this shall continue until death. In case of death within two years, those wholly dependent upon the injured at the time of his death shall receive 66⅔ per cent. of the average weekly wages until six years after the injury; partially dependent persons are also suitably provided for.

When an employer avails himself of the law, he so notifies his employes, and when one is injured in the course of business, the employer makes a report of the injury, giving a detailed description of the accident, and the employe files his application with the board, when, after due investigation, the award, if the claim has merit, will be made. If no award is allowed by the board, the employe may institute suit, not against the employer but against the board, in the court of common pleas of the county wherein the injury was inflicted, and he shall be entitled to a jury trial if he demands it, with the right to appeal as in ordinary cases.

The law is elective and is deficient in not covering all cases, since should the injury result from the willful act of the employer or from his failure to comply with any municipal ordinance or lawful order, the employe shall have the option of going to the state board of awards or sue in the courts, and having done either, he forfeits his right to do the other.

Owing to the uncertainty resulting from this exception, not a great many manufacturers have elected to take the compensation law. It is not known just what course the injured workman will pursue or what action will be taken by the jury should he bring suit. There are many ordinances and laws of the character named in the exception section of the statute and a jury whose sympathies had been excited in behalf of the injured workman and his dependents, knowing that having elected to sue, his only hope of relief is in them, might be constrained to find that the employer had not complied with some such law or ordinance.

The effectiveness then of this highly commendable act is dependent almost entirely upon the course which the workman will pursue—will he apply to the board and content himself with the award, or will he elect to sue, hoping to invoke the sympathies of the jury in his behalf, as has been done in a large number of cases in the past?

The course of the employers in the state will naturally be determined by the course of the workmen of those who have taken the compensation law and of the outcome of the cases of those workmen who elect to sue in the courts. If such workmen apply for relief to the state board of awards and those who sue in the courts in the first instance are unsuccessful, all employers will unquestionably, sooner or later, take the law, as the relief offered is more extensive and more satisfactory.

It is said that so far the injured employes in the state have applied to the state board and in the continental countries, where such laws have been in effect, whether it is compulsory or not, the injured have almost without exception gone to the board.

MICHIGAN STANDARD OPERATING RULES.

(*Continued from page 213.*)

A great deal of time is lost in the use of long distance circuits because of improper signaling. Many operators signal several times in such rapid succession that the distant office has not time to answer between signals. Therefore, all signals should be given slowly and distinctly, allowing at least fifteen seconds to elapse before signaling again. This method will prevent the necessity of repeated efforts.

Short haul calls—those going direct over one circuit, or through switching stations if the distance is short—shall be confined to local circuits, in order that through circuits may be available for through or long haul calls.

The chief operator shall see that through messages switched by her office are, as far as possible, routed over copper circuits and that her operators are properly informed as to which are copper or iron circuits. She should study the equipment she is called upon to handle and possess an intelligent knowledge of the purposes of its several parts.

She shall with the assistance of wire chief, record daily, in the log book, the following information:

1. Report on condition of all long distance circuits entering the switchboard, using the circuit number designated by the Michigan Independent Telephone & Traffic Association. If circuits are in good working order, mark O. K. opposite the number; if circuits are in trouble, the time reported and the nature of the trouble, also the time cleared, nature of trouble found and by whom cleared.

2. A record shall be made of all toll to toll, toll to local, trunk cords or any cords used for long distance purposes if out of order, showing the number of the cord pair, time reported and time cleared.

3. It shall also contain a daily record of the weather conditions.

4. It shall be kept under the direct supervision of the manager, but entries shall be made by chief operator and wire chief.

Faulty operating, defective instruments, poor transmission, noisy or unbalanced circuits, poor connections at switching or other points, or deficiencies of circuits, congestion of traffic, or any interruptions that interfere with the prompt and rapid handling of long distance messages, must be considered in the same way as actual physical trouble on circuits. The chief operator shall be held responsible for knowledge as to the efficiency of all circuits within her territory, and she shall see that trouble of every nature is at once brought to her attention and reported in detail to manager in charge, without delay.

She shall have every toll circuit entering her switchboard, tested every morning to determine whether all circuits are in good working order as far as that office rings on any circuit, and properly reported to the manager and the wire chief, according to the method provided. She shall acquire a working knowledge of the geographical location of the stations reached over the circuits in her division and of the general operating conditions existing at such stations. She shall also familiarize herself with the circuit layout at her station.

(*To be continued.*)

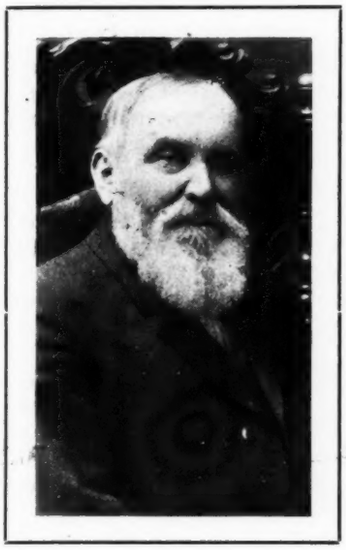
Says Sioux City Merger Is Unlawful.

A. C. Strong, city attorney of Sioux City, Iowa, has placed a stumbling block in the way of the proposed merger of the two telephone companies there. He has filed an opinion with the city clerk on the proposed combination, stating the council has no right or power to make any changes in the existing franchise of the Sioux City Telephone Co.

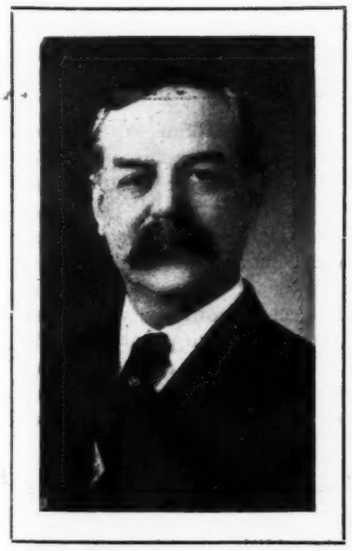
This means that the council will not adopt the resolution presented by the Sioux City Telephone Co. The resolution ratifies the merger despite the "nonpurchase" clause of the franchise, and substitutes a new rate clause.

A Quartet of Men Prominent in the Telephone Field

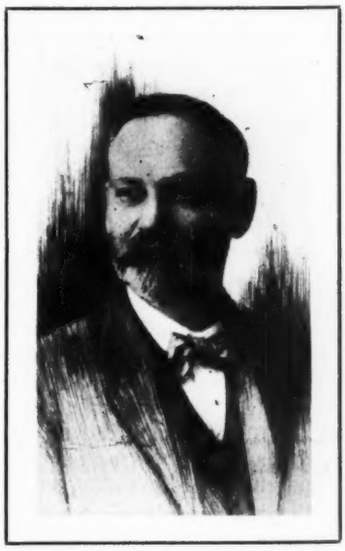
MATHIAS KLEIN, head of the firm of Mathias Klein & Sons, Chicago, was born in the city of Worms, Hessen Darmstadt, Germany, September 20, 1826, coming to this country in 1848. His schooling was more or less irregular and largely self-obtained. He served as apprentice and journeyman locksmith in Germany. Without money or knowledge of the language, he was unable to obtain work in New York and signed on for a three-year cruise on a whaler, from Stonington. The cruise took him around Cape Horn to the coast of Chili, to the Sandwich Islands, China, Japan, Siberia and other Pacific points. He returned to Stonington in 1851, having learned the language and having $100 in actual cash as his capital. Settling in Philadelphia first, he worked at his trade for the then current wages of $5 a week. He was later made foreman and his wages increased to the then high-water mark of $7 a week. Mr. Klein came to Chicago in 1855, finding employment in the shop of Edwin Hunt, a hardware merchant. In 1856 he established himself in his own business.



WILLARD W. HOLLIDAY, general manager of the Illinois Telephone Co., Jacksonville, Ill., was raised on a farm. When about twenty years of age he engaged in the general merchandise business, in which he remained for twenty years. Later he handled live stock, continuing in this line until he began his association with the Illinois Telephone Co., at Carrollton, Ill., July 18, 1900. Mr. Holliday was born in Morgan county, near Chapin, Ill., May 17, 1858. His education was obtained in the country schools. Having taken an interest in the Illinois Telephone Co., he was placed in charge of the company's business at Carrollton, as local manager. There he built up a strong business for his company. The Bell company had an exchange there at the time, but it lasted only fourteen months after Mr. Holliday's advent. He is treasurer of the Illinois Independent Telephone Association and a director of the Illinois Toll Clearing Co. Mr. Holliday has always been active in both state and national telephone affairs. He is a member of the M. W. A.



A. B. CASS, president of the Home Telephone & Telegraph Co., of Los Angeles, Cal., was the first subscriber to the stock of the company, and its first vice-president. He was elected president of the company in 1906. Mr. Cass was born in Albion, N. Y., July 4, 1856. He was educated at the Albion Academy. He is a Mason, a member of the Union League and Sunset Clubs and vice-president of the Y. M. C. A. Mr. Cass' early experience was somewhat varied. He was in the general merchandise business in Ash Grove, Mo., in 1879. From 1880 to 1887, he was a licensed trader at Muskogee, Okla. In 1888 he established a hardware business in Los Angeles, which he still retains. The Home company, of which Mr. Cass is president, was incorporated September 23, 1902. It is largely interested in the California Independent Telephone Association, although Mr. Cass, himself, has never aspired to office in it. He believes in leaving the present capable management in charge. The Los Angeles Home has built up a system of some 45,000 subscribers.



GEORGE W. SCHWEER, secretary and general manager of the Missouri Union Telephone Co., Windsor, Mo., was born in Gerald, Mo., February 16, 1860. He was educated in the grade schools and the Missouri University. Mr. Schweer was in the grocery business in St. Louis for two years, and in the general merchandise business in New Haven for five years. During that time he served as mayor of New Haven for two years. Later he engaged in the general merchandise business in Windsor for ten years, serving as postmaster of the town from 1897 to 1910. He organized the Missouri Union Telephone Co. on April 10, 1899, having held the offices of secretary and general manager since that time. The company operates five exchanges and 300 miles of toll lines, reaching all the adjoining counties. Mr. Schweer was secretary of the Missouri association in 1907 and 1908, and president the succeeding year. He was also secretary of the sixth Missouri district association for two years. He is a Mason and a member of the Knights of Pythias and the M. W. A.

Personal Efficiency a Vital Factor in Modern Business

Every Organization a Grouping of Units in Which Each Individual Must Bear a Part—Qualities Which Make for the Highest Degree of Efficiency—Abstract of an Address Delivered Before College of Engineering, University of Illinois

By Charles Frederick Loweth

There is a human element factor in all of our life's work which must ever be taken into account. Knowledge regarding it is essential, even more so than that of materials and structures.

We are all individual units in this vastly important human element; and the men who direct our activities, and those who work side by side with us, and those whose work in turn we direct, are one and all individual units like ourselves, in the great sum total of human endeavor and achievement. Every human organization is, therefore, a grouping together of these various individual units for the accomplishment of some common end; and whenever such an organization is successful and efficient for the work it is intended to do, it is because the many minds and hands of which it is composed have the proper affinities for each other, and are as nicely adjusted one to the other as are the various elements of a stable compound or the many parts of a perfect machine.

In other words, both individual efficiency and collective efficiency are essential. Individual efficiency is the primary requisite, and it is that which I wish now to consider, and principally that phase of it which has to do with our contact with others.

In a perfect machine, the smallest detail must be perfectly adapted to its work. It must have certain inherent qualities and also certain other exterior qualities; it must have strength for the work demanded of it. It must also have the exact dimensions and other requirements to properly relate it to the other parts. It will not suffice that it be strong enough if it does not fit; or that it fits, if it is not the proper material.

The individual man in an efficient organization must have similar qualifications. He must have knowledge and strength for the work assigned to him; and in addition he must have those other requisites which enable him to properly fit in and co-operate with those who work with him. In other words, he must have adaptability.

Adaptability—Meeting the Other Fellow "Half-Way."

Adaptability is the putting of one's self in tune with his surroundings, so far as practicable without violence to his conscience, and in the adjusting of himself to his fellow-workers so that he may best help them, and permit them to help him; so that their mutual concerns and endeavors may proceed with the greatest ease and certainty and with the maximum of efficiency. All must learn at times to give and take, to bear and forbear.

Has it ever occurred to you that our temperaments and attitudes of mind are as various as our facial expression; that some natures are stubborn and slow to yield, and others are quite the reverse? Because this is so, it is wise not to have a hard-and-fast habit in our relations to our fellow-men, but rather to adjust ourselves somewhat to their temperaments, to their attitudes of mind, and to their different points of view.

It seems to me that the occasions are rare indeed when a man may properly say that he will go half-way in meeting another, and will go no farther. With many men, that rule would result in never getting together. Some are so seemingly stubborn that they will never go half-way, or, if they do, it is only by dint of a mighty effort and much tact and patience on the part of the other fellow. But if it is necessary to go more than half-way with some men, there is a compensation in that it is not necessary to go so far with others, who are of a different temperament and are quite willing to meet you more than half-way.

Don't Be in a Hurry to Take Offense.

It is necessary that we should have due consideration for the other fellow's individual temperament, for his different viewpoint and circumstances in life; and even, if need be, for his idiosyncrasies. If we do not, then we put him at once in the outer edge of our zone of influence, or even entirely beyond it.

Many men have an exterior which quite belies their hearts. In our approach to them they appear different and irritable, perhaps even discourteous, and we feel prone to consider their action as more or less a personal affront; although more than likely nothing of the kind is intended. This result comes about through their misfortune, and, in many cases, they suffer the most. There are men who do not carry their hearts on their sleeves, but who nevertheless have burdens to bear which continually harass and perplex them; these may be financial troubles, bodily indispositions, sickness or other troubles at home, or many other things of that nature. Give such men the benefit of the doubt that there is probably some excuse for their seeming crabbedness, and do not hasten to take offense. It is quite likely to be a matter which in the long run will trouble them more than those who have only occasional intercourse with them. If the business between you is mutual, then on your own account you should adapt yourself in your relations with them to that mood which will best bring about the desired result. If the lack of affability in the other fellow is due to a grouch or because his breakfast did not agree with him, his retribution comes when the larger interest in the business in hand lies with him.

Effectiveness and success in our relations with others are also promoted by that trait of character called tact. Tact is a near neighbor to adaptability. It is subtle and hard to define. The Century dictionary says, "Tact is an intuitive sense of what is true, right or proper; fineness of discernment as to action or conduct, especially a fine sense of how to avoid giving offense; ability to do or say what is best for the intended effect; adroitness; cleverness; address." With some men, it is a natural talent, while with others it must be an acquired one, and oftentimes acquired only by dint of much patience and many unpleasant and unprofitable experiences. But it can be acquired by everyone.

Tact Is a Great Asset.

No man becomes eminently successful who has not a large measure of tactfulness in addition to his many other qualities; and not a few men attain a considerable measure of success because of a superabundant amount of tactfulness in spite of other indifferent qualities. Again, there are many men of splendid qualities and attainments who fall short of the large measure of success they would other-

wise have, because of the little tact which they possess. They seem to have little or no consideration for the different temperaments, viewpoints, and feelings of those with whom they associate, and they know of no such thing as a psychological moment.

True tactfulness does not mean duplicity and deceit; neither does it involve the loss of self-respect nor the sacrifice of honor and conscience; on the contrary, it largely contributes to these.

Patience an Excellent Quality.

Patience is also a quality which will contribute to efficiency and success if used at the proper time and applied with discretion. There is an old maximum which says, "Everything comes to him who waits." I shall not attempt to vouch for the truthfulness of this. I should much rather recommend to you that you proceed with reasonable promptness towards the attainment of those things which you would possess. But if there is any truth in this old maxim, it emphasizes the virtue of patience. Patience is two-fold in its nature. There is that which affects our relations with our fellow-men, and that which affects our relations to our work.

All of us make mistakes at times. We are never always right; and it is necessary that our associates overlook our errors and thoughtlessness, and in turn we must overlook theirs. Doubtless all of us can easily recall instances—and perhaps many of them—where we have experienced mortifying failures because our supply of patience proved insufficient for the occasion. If the other fellow is impatient, that is the time of all others when we should most surely exercise the virtue of being patient ourselves, if we would have the business in hand come to a successful issue.

The other attribute of patience refers to the attitude of mind which a man applies to the various tasks which make up his daily duties. It is perhaps better explained by the expression, "painstaking." The result of painstaking is to do a thing well and thoroughly. The practice of this virtue should become a habit, and may be applied to all of a man's work, whether large or small; and in this way his associates will come to know that his work is uniformly well-considered, carefully done, and always reliable.

No amount of education, superior knowledge, skill, energy or perseverance will enable one to design and build a perfect machine or structure, if the smaller details are slovenly thought out and not considered worth painstaking care; and if for the lack of such care mortifying failure results, it is no excuse to say that we knew better and could have done better had we but been more careful. This is equally true in any other line of work.

Do Not Confuse Patience with Inattention to Detail.

There are many details in ordinary construction which are more largely dependent upon the painstaking care of the foremen and workmen than upon their skill. Success or failure is sometimes due more to the care, or lack of care, in regard to some small detail, than to all of the larger knowledge and skill which enter into the design and construction of the work.

Do not imagine that patience is inconsistent with energy and ambition or with a persistent striving after better things; or that painstaking implies such a preoccupation with small details that one has not the time for, or indeed cannot see, the larger and more important things.

This is indeed a strenuous age, and the demands for speed and quick returns are so urgent that a heroic effort is necessary to be painstaking and not slovenly, thorough and not hasty, deliberate and not impulsive.

Cultivate the habit of observation. Observation is quite different from and is much more than mere seeing. The sense of seeing is much alike in all men, but that of observation varies very largely. If it is not a natural talent, it can be acquired, and is well worth the effort of doing so.

Observation is defined as "a seeing and noting." A very large proportion of all that we see is of little interest, and a yet smaller portion is of abiding interest. We should learn the habit of observing, by which is meant the noting of, or paying particular attention to, or fixing in the mind, those comparatively few of the many things which we see which are or may be of special moment to us.

A little while ago at a gathering at a friend's house, the hostess displayed a small tray on which were thirty-three different articles, comprising a button, pencil, spool of thread, gold ball, thimble, button-hook, hair-pin, and other articles of that nature. The guests were allowed a certain time to look at these, with the understanding that they would later be given a definite time in which they would be expected to note down from memory the articles displayed. Plenty of time was allowed for the exercise of memory after the tray was withdrawn, and yet but one person correctly jotted down as many as twenty-seven articles. Most of the other lists contained many less, and several of them enumerated a number which were not on the tray. This was just a diversion to pass away the time, but it has a practical application.

Two men visit a large industrial plant, a large mercantile business, an extensive piece of construction, or make an examination of the proposed site of some structure. The time is limited for the investigation, and they are to report the results. The reports will be of much or little value, depending upon their powers of observation. Both men see the same things, but the man of better-trained observation will see more quickly and more surely those things which are of most importance to the investigation. If one man must take a longer time to observe the things of which special note must be taken, then in about the same ratio as the time required is the relative efficiency of the two men for such work.

Cultivate Dynamic Imagination.

Imagination is a trait to be commended. With proper training and held in due restraint, it will increase a man's effectiveness in many lines of activity. By imagination I refer to that faculty of seeing clearly in the mind's eye those things which a man desires to build for himself. It may be a piece of complicated mechanism, a pattern for a carpet, a business undertaking, a lawyer's brief, a poem, a structure. This trait is especially valuable to an engineer, as most of his work must be more or less perfectly pictured in his mind's eye before it can be made into a plan, or executed in more enduring materials; and the more clearly he can see the picture in his mind, the more quickly and surely will he reproduce it on paper or in reality.

For more than half of my life I have had a partner. In business affairs she is a silent partner, although she has a considerable measure of worldly wisdom. When she sees a small child quietly and contentedly playing with simple toys she says that child has imagination which enables it to amuse itself by occupying both hands and mind; while another child with little or no imagination must be amused at the expense of some one's effort. So this trait which enables the child to amuse itself develops in more mature years into an imaginative faculty, which when properly trained and controlled brings forth high ideals and incentives for a man's activities and aids in increasing his effectiveness. Note the conditions as to training and holding this faculty in due restraint; and yet another condition is necessary, for imagination must be of the dynamic kind.

(*Continued on page 230.*)

In the Rural Line Districts

Miss Esther Pippin is the central girl this week.—Gann Valley (So. Dak.) Chief.

The new switch board for the Independent telephone office, arrived the first of the week. This fine machine was described in the news a few weeks ago. It is the very latest in switch boards, and will greatly facilitate the handling of the business.—Mound City (Mo.) Jeffersonian.

George S. Barnes is constructing a telephone line from this city to his farm 18 miles south of town, There are many farmers in that locality and it is likely that within a few months the lines will be run all through the town of Barnes and Hughes. The telephone is now considered a necessity in most of the rural districts, though the town of Oulu, which contains the largest rural population of any government township in Bayfield county, is still without 'phones, strange as this may seem.—Washburn (Wis.) Itemizer.

The stockholders of telephone lines 60 and 162 gave a picnic dinner, served by the ladies, for the men that moved the poles where the new county road is being made south of Bert Rarick's, hence the line was out of service.—Petoskey (Mich.) Independent.

G. O. Upham, the manager for the Hawkeye Telephone Company came from Carlisle on Friday, riding his new motorcycle.—Palmyra Item, Indianola (Ia.) Herald.

Our telephone lines are getting a much needed over hauling by Mr. James of Clarinda. Clyde Whitmore has done the repairing on the telephone lines for several years, but has almost been forced to do it, as there was no one else to do it. Clyde is a splendid workman and always gave satisfaction.—Northern News Coin (Ia.) Gazette.

The Clark County Telephone Co. is improving their line this week by putting on two more wires.—Sherman Item, Loyal (Wis.) Tribune.

The telephone people of Ellsworth have been making extensive repairs out here this week.—Loraine News Ellsworth (Kan.) Reporter.

The Tri State telephone crew has been in and round the village at work during the last few days.—Easton Brevities Wells (Minn.) Advocate.

Now that Kane is on the boom, and the carpenter's hammer, as well as the swish of the painter's brush, is heard all over the village, let us turn our attention to a telephone exchange.

This project has been tried repeatedly without results, but let us all get together on the matter and do things.—Kane (Ill.) Telegraph.

The telephone men were busy Saturday working on the new switch board. This will be a great improvement.—Central City (Neb.) Nonpareil.

The telephone line has been extended through this neighborhood and the people are making good use of their phones.

Rev. Osburn has been returned to this charge for another year.—Bailey Ridge Correspondence Londonville (O.) Advocate.

HELLO TILLIE, IS THAT YOU? HO-HO- YOU OLD SWEET THING, SAY HONEY COME ON OVER TO THE PARK FOR A LITTLE STROLL, WILL YOU? ITS A FOINE AVENIN.
SURE AND OI WILL DENNIE, I'LL MEET YOU AT THE FOUNTAIN IN ABOUT TWINTY MINUTES

Through the courtesy of the Summerville Telephone Company the Brookville police department is now equipped with the wayside telephone, a contrivance by which the night policeman, on his beat, can be almost instantly put in touch with any one needing his services. Several telephone attachments have been placed on poles about town, and the policeman is equipped with a receiver and transmitter which can be attached to them, thus putting him in touch with the central and any house or business telephone on the Summerville system. If you need the policeman at any hour of the night, call Summerville central, and it will be only a matter of a few minutes until you will be put in touch with him.—Brookfield (Pa.) Republican.

"Johnny, what change takes place when ice is changed to water?"
"A change in price, ma'am."

Same thing happens when your iron lines turn to rust, break and flop gracefully to the ground.

It's on account of this fact that so many telephone men are replacing their galvanized lines with Copper Clad.

Copper Clad *doesn't rust, doesn't break,* is far more efficient electrically and mechanically than the galvanized and far cheaper in the end.

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The Warner Pole Changer uses current from power battery only when signalling.

All parts subject to wear are easily replaced so the Warner Pole Changer is practically everlasting.

There are 16,000 Warner Pole Changers in use and every owner is getting satisfactory and inexpensive ringing power.

Perhaps we can show you a way to get better ringing at less cost—write and see.

Warner Electric Company
Muncie, Indiana

PRIVATE BRANCH EXCHANGE TESTING.

(*Continued from page 202.*)

It also changes the drop of potential between the negative poles of both batteries. In this case the e. m. f. is 5.75 volts, but should the charging current be increased to .5 ampere then the e. m. f. would increase to 11.5 volts, just twice as much.

This drop of potential is measured when the key *A* is on the point 2 and the key *B* is on point 4, it being understood that the voltmeter is reversed when testing for battery. As the resistance of the voltmeter in this case is high compared with line and cord resistance, in fact over 99 per cent., the reading therefore is almost correct.

As *Bl*, the battery line reading, equals the charging drop across the ground return and is in series with *E*, the reading for the battery on the mate with the key *A* on point 2 and key *B* on point 3 would be:

$$Bm = Bl + E \qquad (21)$$
$$= 5.75 + 24 = 29.75 \text{ volts.}$$

Knowing *Bm* from the reading taken to be 29.75 volts, then *E*, the voltage of the branch battery, must be

$$E = Bm - Bl \qquad (22)$$
$$= 29.75 - 5.75 = 24 \text{ volts.}$$

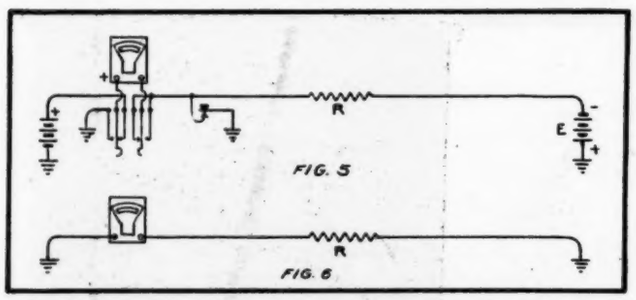
The ground reading is taken with the key *A* set on point 1 and the key *B* on point 4, then

$$Gl = V - Bl \qquad (23)$$
$$= 22 - 5.75 = 16.25 \text{ volts,}$$
$$\text{and } V = Bl + Gl \qquad (24)$$
$$= 5.75 + 16.25 = 22 \text{ volts.}$$

Gm = 0, but a reversed reading may be read if the meter is provided with a reversed scale as $E + Bl$ is greater than *V*.

$$\text{Reversed. } Gm = E + Bl - V \qquad (25)$$
$$= 24 + 5.75 - 22 = 7.75 \text{ volts.}$$

If the voltmeter resistance is low, the correction for the drop in the line resistance may be computed by the following



Circuits for Testing Battery and Measuring Ground Potential.

formulas, calling *Bl* the corrected reading and *eg* the battery on the line reading.

$$Bl = \frac{eg}{\frac{Rl + r}{5.75}} Rl + eg \qquad (26)$$
$$= \frac{5.75}{23 + 32 + 8500} \times 55 + 5.75 = 5.79 \text{ volts.}$$

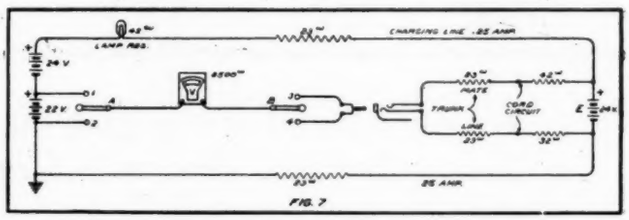
$$\text{and the true } Bm = \frac{Bm}{\frac{Rm + r}{29.75}} Rm + Bm \qquad (27)$$
$$= \frac{29.75}{65 + 8500} \times 65 + 29.75 = 29.987 \text{ [volts.}$$

$$\text{And } E = \frac{Bm - Bl}{\frac{Rm + r}{29.75 - 5.79}} Rm + (Bm - Bl) \qquad (28)$$
$$= \frac{29.75 - 5.79}{23+10+32+8500} \times 65 + (29.75 - 5.79) = 24.14 \text{ [volts.}$$

In justification of this problem, it may be said that while the percentage of branch exchanges which have to be charged metallic is not large, there are times when a difference of ground potential exists due to faulty return of an electric car line, or induction from it, or any source, and may cause enough noise at the P. B. X. so that an intelligent conversation can not be carried on.

Where the testing e. m. f. is less than the e. m. f. of the branch battery, then *E*, the branch e. m. f., will be equal to a reversed ground reading on the mate plus the voltage of the testing battery, providing that the line resistance is comparatively small, in which case in Fig. 2,

$$E = \text{Reversed } Gm + V \qquad (29)$$
$$= 2 + 22 = 24 \text{ volts,}$$



Another Battery Testing Circuit.

and where the line resistance is comparatively large, say 1,500 ohms, then

$$E = \frac{\text{Rev. } Gm.}{r} (R + r) + V \qquad (30)$$
$$= \frac{1.3\frac{1}{3}}{3000} (1500 + 3000) + 22$$
$$= 24 \text{ volts.}$$

In this case the reversed *Gm* must be 1.3⅓ volts, the proportional drop across the voltmeter. The difference then between the first method and the corrected formulas is two-thirds of a volt.

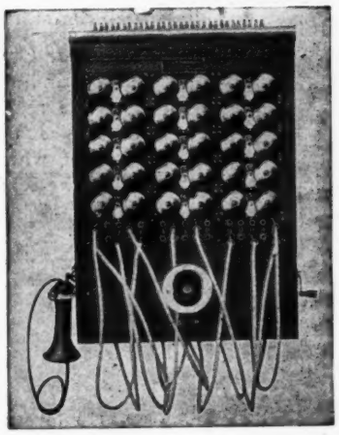
There is just one more point to make clear and that is, when testing for a ground reading as shown in Fig. 2, where twelve storage cells of small capacity are used at the P. B. X., the voltage is generally 24 volts. The voltage of the central office battery will vary from 22 volts to 29 volts, particularly on overcharge day. Thus it will be seen that if *V* is 29 volts, and *E* is 24 volts, *Gm* will be 5 volts, and the reversed *Gm* will be 0.

To enable the reader to see at a glance the difference of grounds and battery readings which may be obtained from two voltmeters of different resistances, the following table has been compiled.

The column headed "PR" shows the ground potential reading, while that headed "TP" the true ground potential.

G Ground	B Battery	V	E	r	R	TP	PR	% Voltmeter Drop	Figure Number
5.6 +	16.8 +	24	18	3000	210	....	.....	.93	2
5.92+	17.76+	24	18	16000	210	....	.....	.987—	2
4.	12.	24	18	3000	1500	....	.....	.66⅔	2
5.48+	16.45—	24	18	16000	1500	....	.....	.906+	2
2.	6.	24	18	3000	6000	....	.....	.33⅓	2
4.36+	13.1 —	24	18	16000	6000	....	.....	.625	2
48.36	26.2	24	18	3000	210	10+	9.3	.93	5
29.76	7.48	24	18	3000	210	10—	9.3	.93	5
76.26	13.1 —	48	24	3000	210	10+	9.3	.93	2
22.66+	9.⅓	48	24	3000	1500	10+	6.⅔	.66⅔	2
34.⅔	18.⅔	24	18	3000	1500	10+	6.⅔	.66⅔	5
21.32	5.⅓	24	18	3000	1500	10—	6.⅔	.66⅔	5
39.2 +	16.8 +	24	18	3000	210	....	.....	.93	5
28.	12.	24	18	3000	1500	....	.....	.66⅔	5
14.	6.	24	18	3000	6000	....	.....	.33⅓	5
.....	.....	..	..	16000	210	10	9.87+	.987+	6
.....	.....	..	..	16000	1500	10	9.12+	.912	6
.....	.....	..	..	16000	6000	10	7.28—	.728	6

Considering the first two readings, it is seen that the line resistance is comparatively small, although it is a maximum for a city office. In this case the efficiency of the low resistance voltmeter is 93 per cent. The second set of readings show better the advantage of a high resistance voltmeter, reaching an efficiency of 91 per cent. for the high meter, and 66⅔ per cent. for the low meter. If it is assumed that the battery reading of 12 volts, read from the low resistance voltmeter is correct, then the difference of 3 volts would look as though there was something wrong with the P. B. X. battery.



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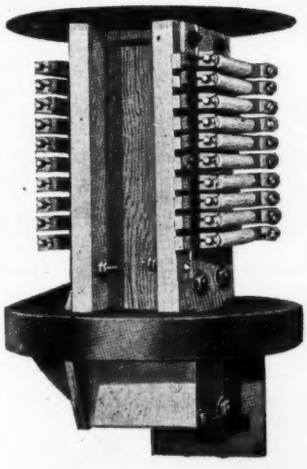

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Practical Subjects—Letters and Discussions

Some Experiences of a Manager.

I once knew a manager, newly elected, who had had only electric light experience. It was a small company and the first day an angry subscriber came in with a big tale of woe. Nothing would do but that the manager himself should fix his telephone so it would talk.

The manager was a good bluffer and, to be a good fellow, went over to fix the telephone. It was an old "corn plaster" transmitter and as soon as unscrewed, the carbon fell out. The manager was angry and remarked, "Who in thunder put gun powder in this transmitter." After that he was a joke. If you do not know your business do not shout it.

Yet on the other hand, the dollars can be squeezed so hard the eagles scream, which is not good for either the dollar or the company. I once worked for a company whose president had charge of everything from financing the plant to buying the toilet paper. He squeezed the pennies so hard they called him "Penny ——." His farmer lines were of No. 14 iron. His instruments had three and four bar generators, and 1,000-ohm ringers and were placed up to 17 on a line.

By leaving the arresters off, he saved 11 cents each. He made his arresters by wrapping a few turns of No. 36 cotton insulated wire around the binding posts and to ground. A good discharge would burn the insulation off the wire and follow it to ground, usually burning the wire. The next flash would burn the ringer coils. Sometimes the charge would not be heavy enough to burn the wire, but would burn the insulation off and ground the line. The liveryman would make the most of that deal.

The same man used to handle the operators' salary. In his office I found a sheet showing how he figured the salaries, reading: "In every common year there are 365 days, one of every four years . . . . An operator, after deducting one hour for five holidays, works 281,264,281 hours per year. At 10 cents per hour her wages equal 74 cents less than $23.50 per month." At the bottom was a note in lead pencil: "Operator No. 3 was raised to .1003 per hour beginning with 12-1-05." Lucky girl! The office girl received 12 cents per hour. She was late 15 minutes Thanksgiving noon and was docked 3 cents.

Some of the operators had worked seven years without a vacation. Most of them bled the company every chance they got. They worked like a steam engine with the fire nearly out. I gave each employe a week's vacation with full pay and another week on his own time. It not only paid in dollars and cents, but changed a bunch of knockers to boosters.

In this system there were about 2,200 telephones on five exchanges. In the main office, there were seven people employed. The book keeping system was a model for detail, yet it would take months to strike a balance, for the system was nothing but detail. In fact it was July before I found out how many telephones were working in January. Some exchange books were eighteen months behind in posting. A subscriber could be in another state a year before the book keeper discovered he was behind in his rental.

I installed an addressograph and a self-auditing system and it was not long before the books were posted up and half the office force doing the work and keeping up to the minute too. At night I could tell how many subscribers there were, the monthly income as it stood, the increase or decrease. Was I popular? I should say not.

Now I had made a few discoveries when I struck a new balance. I found over $15,000 unpaid rentals on the books. The company was selling stock and had paid 8 per cent. since organization and claimed $12,000 reserve fund. I discovered that the dividends had been paid on the rental charges, not collections. The reserve fund was somewhere among the unpaid rentals, a good share of which were uncollectible. I confided my find to one of the leading directors and asked him to help me straighten things out and get the company on a solid foundation. At the directors' meeting the next day, he was elected manager. As that was my title, I asked him what his plans were. He said the first thing was to fire me. He did.

Moral: Tell your troubles to a policeman.

I was with one company four years that was up against it. It covered part of two countries with about 2,000 telephones. The rates were $1 and $2. The Farmers' Mutual rate was 50 cents and the Bell's 25 cents. Yet we were getting the best business on superior service. We always collected the rent, moved telephones free and would stand for almost anything except to be slapped in the face.

Nearly everybody rented farms and on one exchange 40 per cent. of the farmers moved one spring. Guess the rest were too poor to move. As we did not have the nerve then to raise the rates, we braced things up temporarily by mailing a typewritten letter to each subscriber, explaining in plain words the situation, what it cost us to collect, move telephones, etc., and making a 25 cent raise, but the 25c was to be rebated if they paid in advance by the 10th of the month.

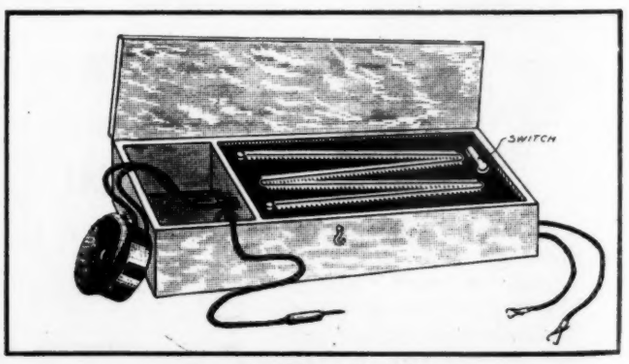
We also explained that somebody had to pay for the moving and we thought the fairest way was that the person who caused us the extra expense, should pay for it. We would make an inside move for actual cost, a town move for $1 and a country move for $2 (which is too cheap) but this would be rebated if the person moving into the place vacated kept the telephone. That made every mover a solicitor for the time being. We saved from $100 to $200 per month.

Nebraska. R. C. C.

How to Make and Use an Ohmmeter.

By A. L. Field.

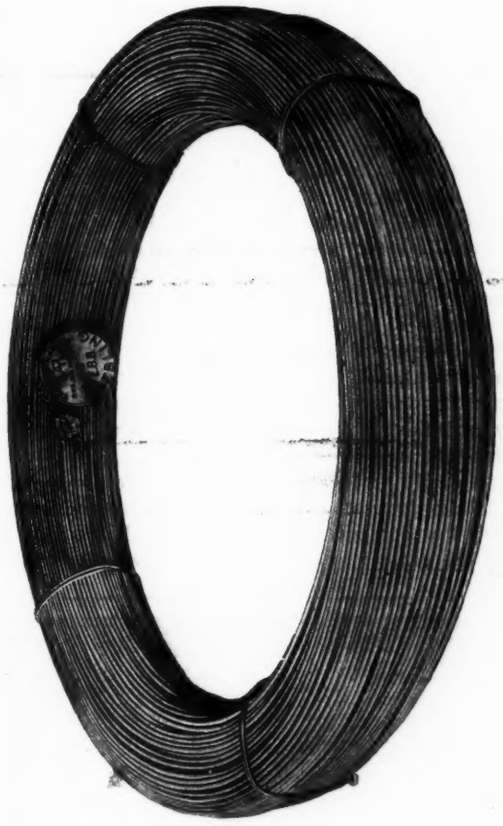
An ohmmeter is a very simple instrument, easily made, at very little expense. It consists simply of a Wheatstone bridge with a permanent resistance at one end, the other end being connected to the circuit or coil under test. The



The Ohmmeter Assembly.

scale reading is directly in ohms and a receiver is used to detect the quiet place on the slide wire. One very convenient form that I have used a great deal is made as follows:

The box is of quarter-inch hard wood, with a flat hinged cover, 9 in. long by 2½ in. wide by 2 in. deep, inside meas-



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of the manufacture of **Roebling Double Galvanized Telephone Wire** is conducted with one end in view —to produce durable, uniform wire of high conductivity.

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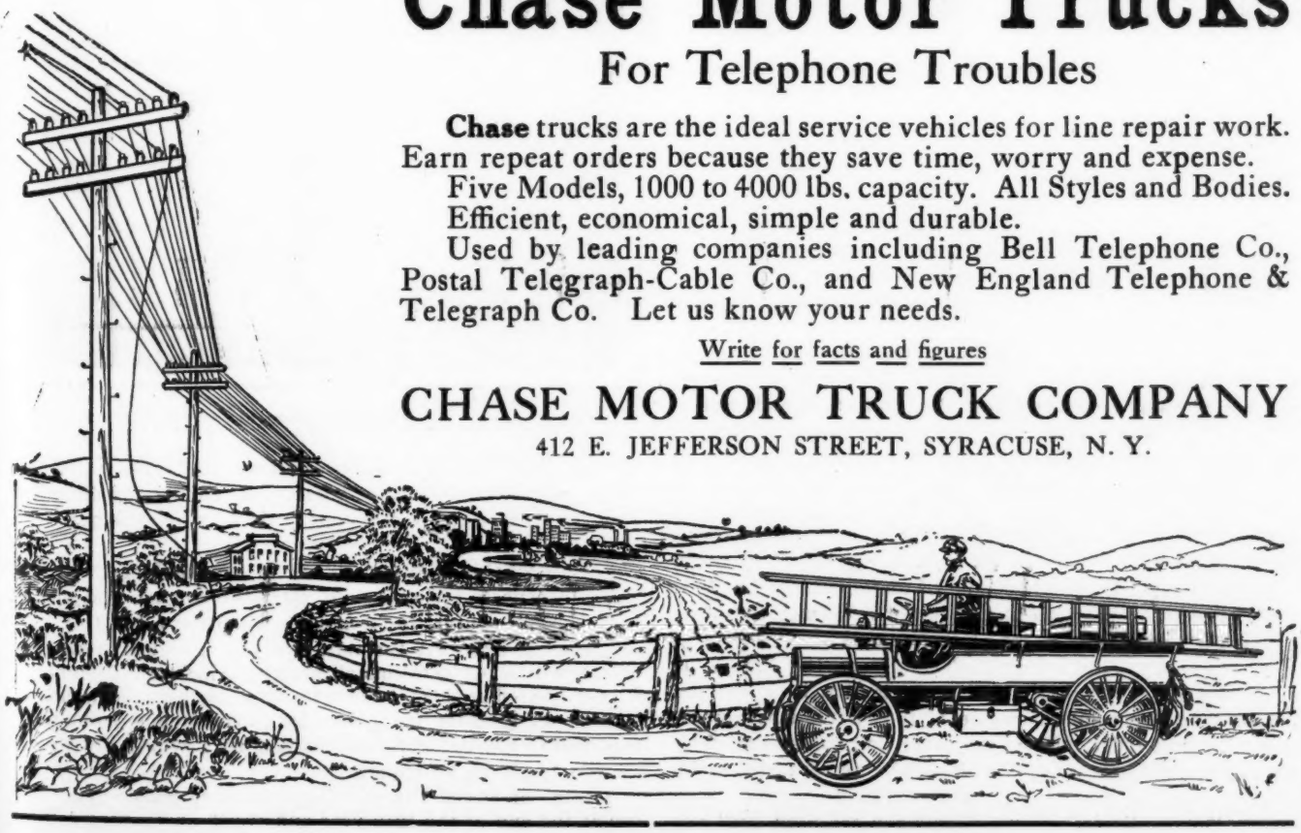

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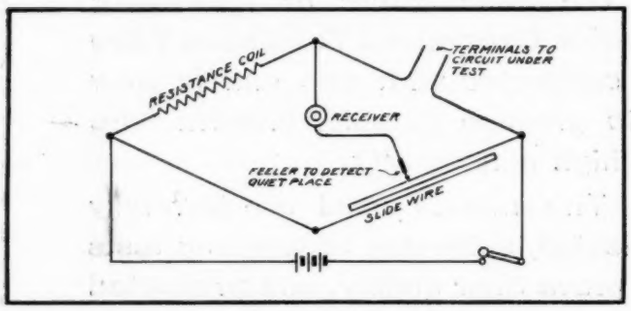
Please tell the Advertiser you saw his Announcement in TELEPHONY.

urement. A partition two inches from one end provides a space just large enough to hold a watch case or switchboard receiver. In the other part of the box may be fastened the resistance coil, dry battery and a switch for opening and closing the battery circuit.

I used an old switchboard drop coil of about 250 ohms



Circuit of the Ohmmeter.

resistance for the permanent resistance, and the small three-cell battery, made for the pocket flashlight, is of just the right width to fit in snugly. This, with the coil, should be packed firmly. The board with the slide wire on it is fastened with its upper surface one-quarter of an inch from the top of the box, and holds the battery and resistance in place.

Very small German silver wire can be used for the slide wire, although I have had as good results with very small fuse wire. A piece of white cardboard should be placed on the board upon which the slide wire is to be put, as this provides a good surface upon which to mark the scale divisions. Running the slide wire across the box four times requires a wire about 24 inches long, and the scale divisions are greater than with a shorter wire.

For attaching to line, I used two switchboard transmitter cords having small snaps on the ends for clasping the line wires. A single conductor cord with a brass tip on the end, flattened and sharpened, can be used as a feeler to find the quiet place on the slide wire.

The object in making the ohmmeter so small is that it is light and handy, may be carried in a repairman's satchel, or can be carried up a pole and in fact used anywhere. For most work it is as accurate as it would be with a larger battery and much more convenient.

One of the uses to which the ohmmeter can be put and never fail, is in locating bad connections. To locate a bad connection in a common battery line, it is necessary to disconnect the line from the switchboard either at the cross-connecting rack, or at the cable box, and shorting the line side. As the subscriber's end of the line is always open when the receiver is on the hook, the line can be tested at any point, the quiet place on the slid wire showing the number of ohms resistance from that point to the short circuit in the cable box or cross-connecting rack. By knowing the resistance per mile of the wire in the circuit being tested, it is easy to calculate whether the resistance is greater than it should be. A bad connection generally gets to be very high resistance before it interferes seriously with the service. A mile of No. 12 iron wire is about 33 ohms resistance, or 66 ohms for a mile of metallic circuit.

To measure a magneto line, it is not necessary to short-circuit the line or put it out of service at all. As the drop coil on the switchboard is bridged across the line, it is necessary only to know its resistance so that it can be deducted from the total resistance of the circuit when measuring into the office. If the magneto line has several telephones bridged across the line, it will be necessary to make an allowance for the ringer coils cutting down the resistance. Where divided circuit telephones are used with not more than ten on a line, it is unnecessary to make much allowance for a rough test.

In measuring for a cross on iron wire circuits, if the wires are very rusty, the chances are that the ohmmeter will not indicate a short circuit at all. Where the wires are in a fair condition, the resistance of the cross itself is generally little or nothing, and can be located quite accurately.

One advantage in testing for a cross with the ohmmeter is in being able to tell which way the cross is from any point on the line without opening the line. This can be done by making a test at one point, then go a quarter mile either way and make another test. If the last test shows less resistance than the first, the cross is in that direction, but if the last test shows greater resistance than the first, the trouble lies in the opposite direction. A switch hook or generator shunt failing to cut out in a telephone on a party line, causes poor ringing service, but does not interfere seriously with the talking qualities of the line, making trouble hard to locate.

This can easily be located with the ohmmeter as the resistance of the generator winding or receiver and induction coil is very low compared to the bells on the line.

To get the scale marked correctly, it will be necessary

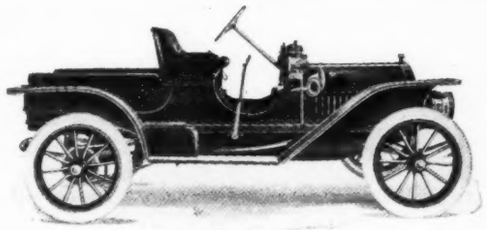
Using the Ohmmeter.

to have some coils of known resistance. With a few of these, and the combinations obtained by connecting different ones together, a fairly complete scale may be arranged.

Probably 50,000 A. T. & T. Stockholders.

The prospects are that now, after the August 1 payment & Telegraph shares, the company will have a total of 50,000 stockholders. At the time the July dividend went out of the last 25 per cent. installment on American Telephone it was distributed to approximately 49,500 stockholders, so that an increase from the last payment and from new investment buying of 500 up to August 1 would not be at all too much to anticipate.

A total of 50,000 shareholders compares with under 40,000 at the end of the 1910 year and 47,000 on January 1 last.



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Telephone Auto Cars are built expressly for telephone work—capacity 1,000 pounds. Trouble shooting, hauling, collecting, etc., made easier by the use of the Schacht—sufficient space for carrying all necessary construction materials and tools in rear.
Can be easily converted into a light truck, runabout or touring car.
Always ready for immediate use.
Fourteen inch road clearance enables the Schacht to travel rough roads through mud or snow.

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We Guarantee
Greatest Efficiency
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Write for FREE SAMPLE
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Approved by Leading Institutions of Technology and Telephonic Science. Handled by most representative Jobbers and Supply Houses.

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OUR W. & M. Telephone Wire is drawn from metal made especially for the purpose and rigidly inspected. The spelter is carefully laid on with uniform thickness, ensuring ample protection for the wire under extreme weather conditions.

In point of conductivity this good wire has attained the highest possibilities and we submit our three brands—"E. B. B." "B. B." and "Steel"—as the best that can be produced.

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We Make

American Wire Rope	Barbed Wire
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APPLICATION OF COST PRINCIPLE TO RATES.

(*Continued from page 204.*)

called is securing the use of that investment. If business telephones had communication only with other business telephones located within a densely settled portion of the exchange area, and if residence telephones had communication only with other residence telephones located within the relatively sparsely settled portions of the exchange area, a strict application of the cost principle might conceivably lead to residence rates which are higher than business rates. But the value of the business telephones to very many classes of business men is almost entirely dependent upon the possibility of communication with residences and for every message which passes between a residence and a business telephone, both parties have made use of the investment required for both telephones.

It hardly seems fair to consider only the telephone which originates the message. As conditions exist at the present time, we believe that there is generally a relation between telephone rates for different classes of service and the cost of that service. This may be at the same time related to the value of the service, and it is only reasonable to suppose that this is the case.

Subscribers will take the more expensive class of service as the use of the telephone increases. The service is more valuable to them as this use increases, the cost of the service to the company is greater, and the rate which they pay is greater as they take the higher grade of service.

Under the present flat rate plan, the cost principle does not apply as between subscribers in the same class. For example, two subscribers may each have received four-party residence service; one may use the telephone a great deal more than the other, yet both pay the same rate although the cost of serving them both is not the same.

Again, one subscriber may have a single-party residence telephone for which he pays a lower rate than another subscriber who has a single-party business telephone, although his use of the service may possibly be greater.

This, however, is a defect of the schedule of rates for furnishing unmeasured service, just as such defects exist in connection with a flat rate for water and electric service. It is not due to anything connected with the cost principle as a basis for telephone rates any more than the fact that one flat-rate consumer of the product of a water utility uses more water at the same price than another flat-rate consumer is an argument against the cost principle as applied to the rates of a water company for metered service. This defect is inherent in the flat-rate plan, but is not a defect in the cost principle of rate making.

Some Modifications Inevitable.

We recognize that, as far as exchange telephone rates are concerned, modifications of the cost principle may have their place. The value of the service, the ability of certain classes in the community to pay for telephone service and other factors may affect rates, and the greatest good of all classes of subscribers may be served by permitting certain deviations from the cost basis. But we believe that it is true that the cost basis is recognized and must be recognized in schedules of exchange telephone rates.

Other elements may modify the rates, but these other elements are not controlling and as a general thing, should not control. It is conceivable, of course, that conditions might exist where these other elements should be controlling and where the cost principle should be secondary in order to secure the best development of the business and the greatest good to all parties concerned, but this is not the general situation.

The cost principle is applied as between classes of rates for telephone exchange service. Modifications of rates based on the cost principle may result from the effect of these other factors mentioned, but primarily the cost basis determines the rate and other elements are secondary.

The Apportionment of Rates.

In Telephony of August 3, I was interested in the article headed "The Apportionment of Rates" and as I have had some experience in that line I beg to express my views regarding same.

I believe that the apportionment of rates should be governed entirely by local conditions as, in some localities a telephone system can be made to pay out under much lower rates than in other localities. For instance in a locality where conditions are such that a system can be constructed for say $40 per subscriber, a company can operate on much lower rates than one where it requires an expenditure of $65 per subscriber, due to the depreciation and interest on investment.

Also in some localities elements, such as the weather, are such that the outside construction has a much higher depreciation.

The exchange that the writer has in charge has a high installation cost owing largely to a large number of forest trees with which we have to contend. However under Independent management, we are able to pay out with very reasonable low rental rates.

Monroe Johnson, Manager.
Emmetsburg, Ia. Emmetsburg Telephone Co.

News of Argentine Telephone Company.

The report of the directors of the United River Plate Telephone, Ltd., operating in the Argentine Republic, for the year ended March 31, last states that the gross receipts in sterling were £468,992. Deducting expenses in Argentina and London, debenture interest, dividend on preference shares, and interim dividend on ordinary shares, and adding interest on investments, transfer fees, etc., and £5,393 brought forward, there remains an available balance of £102,843, says the Electrical Review, of London.

The provision for renewal of plant chargeable against revenue for the year has, as previously, been estimated and included in the item "maintenance." A further appropriation for the renewal fund is proposed, the directors, as mentioned last year, being of opinion that owing to the increase in the plant the fund requires strengthening. After making the proposed appropriations shown below, the directors recommend that a final dividend of 5 per cent. be paid on the ordinary share capital, making with the interim dividend paid on December 30, last, a return of 8 per cent. for the year, free from income-tax, and that the balance of £5,493 be carried forward.

The company continues to make satisfactory progress, and in consequence fresh capital is required. It is proposed to make an issue forthwith of 40,000 ordinary shares to the ordinary shareholders at par.

Courage of a Kentucky Operator.

A Louisville dispatch says that Miss Ida Ochsner, of Lyndon, Cumberland Bell operator at Pewee Valley, is being praised for her bravery during a recent bad fire there.

The exchange was located in a hall over the grocery, where Miss Ochsner was on duty alone. Instead of making her escape at once, she remained at her post, notifying the 250 telephone patrons at Pewee Valley, and calling for aid from Anchorage, until all exits were closed by the flames. To escape from the burning structure she was forced to swing out of a window and climb down a cable pole.

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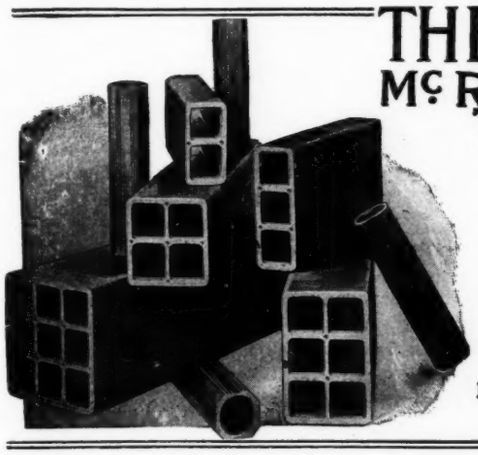

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Specify either of the above standard makes when writing your underground specifications.

Factories East and West, enable us to figure reduced freight rates, assuring you of the lowest delivered prices without sacrificing quality in any way.

Large stocks of both single and multiple duct constantly carried, thus insuring an early delivery.

Our conduits have been used for twenty-three years. Inquire about us in any city where conduits have been installed.

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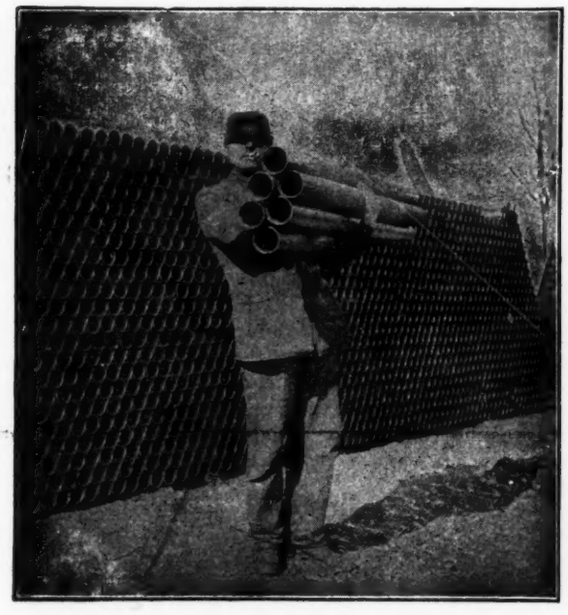

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Made in FOUR STYLES OF JOINTS

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WITH BENDS AND FITTINGS FOR SAME

Is the lightest conduit made

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Please tell the Advertiser you saw his Announcement in TELEPHONY.

PERSONAL EFFICIENCY A VITAL FACTOR.

(*Continued from page 219.*)

Without these checks, and energy following it up, imagination may run riot and be as little productive of accomplishment as with Mr. Barrie's "Sentimental Tommy," who had many lofty dreams and aspirations, which came to no large and enduring results because of his lack of practicability and steadfastness of purpose.

Qualities Which Make for Success.

Years ago, when beginning my engineering experience and spending my spare time in study, I came across an engineering classic rarely seen nowadays, Stoney's book on "Strains," on the title-page of which was a six-line verse defining art, but also illustrating the point I have been trying to make. I will quote it:

"He justly is despised
Who ne'er did thought to his labors bring;
For this is Art's true indication,
When skill is minister to thought,
When types which are the mind's creation
The hand to perfect form hath wrought."

These qualities, along with many other homely ones, help us in our individual efforts and also make us more efficient in our relations with others. They promote collective as well as individual efficiency, and both are necessary if our common endeavors are to progress with the highest measure of effectiveness and success.

If we are to be the most efficient units in any organization, it is necessary that we have not only a thorough knowledge of our own duties and the work assigned to us, but in addition some knowledge of the duties and responsibilities assigned to the others with whom we co-operate, so that we may properly relate our efforts with theirs and, if need be, help them and permit them to assist us. Indeed, something more than mere knowledge is necessary in this connection, for there must be a deep-seated spirit of co-operation and mutual helpfulness, so that, if necessary, we can begin our work on the foundation that another has prepared, and turn over our work for some one else to add his share.

It is also necessary that we so adjust ourselves in such a large spirit of co-operation that the work of all may proceed simultaneously. We may not always hold back our work until the man who precedes us has fully completed his, and sometimes our work may drag or be delayed and we cannot keep him who is to follow from treading close on our heels. This interlocking of our joint efforts must not bring about conflict and jealousies, which would result in wasted effort, friction, delays, and in the work being inefficiently done and without that pleasure which comes as a result of successful endeavor.

No engineer attains to the highest measure of efficiency and success solely by his knowledge of such things as materials, structure, and mechanical processes. For these are of no value without human direction and control. Knowledge and equipment for active life are incomplete without knowledge of how to deal properly with men and to use and be used by them.

We hear much nowadays of captains of industry, captains of finance, captains of politics, and captains along many other lines of human endeavor. These are men who have learned how to combine most effectively with their own efforts those of a corps of assistants skilled in the mechanical, financial, or other agencies which are best productive of the desired results.

We cannot all be captains, but in these days it is quite certain that we shall be found somewhere in some captain's army, and we are desirous of being commissioned officers and something more than high privates. The measure of success we attain in this will be dependent not only on our knowledge, education, and native ability, but also in no small measure upon our ability to co-operate in the largest sense with our fellow-men.

If you are able to analyze the potentialities of men, quantitatively and qualitatively, and, so to speak, to determine their elastic limit and safe speed, and to properly assort and assemble them into harmonious and effective human machines, ordinarily called organizations, then you accomplish much more than would be possible with the most perfect and far-reaching knowledge of the strength of materials, and of machine and structural design alone.

We represent the efficiency of a machine by a curved line. Has it occurred to you that there may be efficiency curves for man? Let us see. Let his age be represented by by the divisions of the horizontal, and assume his active life as beginning at twenty years; his previous years being considered as preparatory. His efficiency may be indicated by ordinates. This factor is not as readily and definitely arrived at as are horse-powers and kilowatts, but can be roughly approximated by various units.

If the curve is for a bricklayer, then his efficiency is approximately represented by the number of bricks he lays in a day's work; if the curve is for a concrete foreman, the efficiency is roughly estimated by the cost per cubic yard of the concrete his crew puts in place in a day. But in most cases, efficiency cannot be expressed in such definite terms and may be roughly approximated by the position the man has attained, the salary he receives, his achievements, or the wealth he has accumulated. Position, salary, achievement, and wealth can never be true indications of success, and are only taken in this connection as being rough approximations, and more convenient for the illustration in hand than truer measures.

What Constitutes Success?

In the same way in which there are different efficiency curves for the various types of engines or of pumps, motors, or other machines, just in the same way are there varying curves of efficiency for men.

It will be interesting to observe the varying curves approaching a given efficiency; one may be a straight line; one convex upward; another concave upward.

The work of life for all is, after all, much alike, and the traits and qualities which make for genuine efficiency and success are very much the same, whatever a man's vocation, whether it be as an engineer, banker, merchant, railroad manager, teacher, or any one of the many other walks of life. Undoubtedly, some particular qualities make for a success and efficiency more in some activities of life than do others, and happy is he who will ascertain, as far as he can, his own natural shortcomings, and by dint of earnest and constant effort endeavor to correct them.

We may ask ourselves, What constitutes success? There will be many answers to this, but after all may it not truthfully be said that the largest measure of success lies in the realization in a man's inner consciousness that he has consistently had high ideals of life and purpose, and has with energy and with the utmost of his ability endeavored to make them realities; and also that he has a conscience void of offense? The world is made up of many men of many minds, and no man can hope to conduct himself so as to entirely escape criticism and fault-finding. No matter what his conduct, there will surely be some one who will complain because it has not been otherwise; but happy is that man who has so walked that he need not accuse himself.

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J-M Transite Ebony Asbestos Wood is superior to other materials for every kind of switchboard service for the following reasons:

1. It has higher electrical resistance than slate, marble or fibre (almost equal to that of sheet mica), and withstands higher electrical voltage than any of the above-mentioned materials.
2. Possesses greatest fire-resisting properties for switchboards.
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7. Takes a high polish.
8. Eliminates switchboard troubles.

Use J-M Transite Ebony Asbestos Wood for every kind of switchboard service.
Write nearest Branch for sample and interesting booklet on switchboards.

H. W. JOHNS-MANVILLE CO.

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THIS rod has a self-contained wire connector. Insert the ground wire and drive the key—that's all. Makes a *quicker* and *better* connection than the average soldered joint. Write for particulars.

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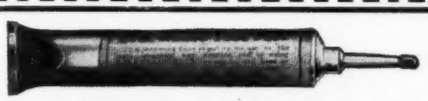

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L & N Lineman's Fault Finder

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May we send you details?

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Sparks from the Troubleman's Department

After-Dinner Speeches By Telephone.

By Charles Phelps Cushing in Judge.

Simultaneously with the renewed applause for wireless telegraphy and the appearance of accounts of new exploits of that most marvelous of detectives, the dictagraph, behold the after-dinner speech via long-distance telephone coming again into high favor. These many years we have enjoyed the love-making and the business advantages of the telephone, without knowing how to appreciate to the full its excellence for banquet use.

The Author.

The most obvious comment is from the diner's point of view, the mad joy of at last being able to shut off a flow of oratory whenever the interest begins to lag. Sensing the imminence of a flight of bombast or a frayed anecdote, he may lay down the receiver and take up an apple or the nut crackers. No doubt this is a tremendous consummation. North and South, on the Pacific slope and the Atlantic, editorial writers of all parties have said so in perfect agreement.

But to stop here is to retire after only scratching with a pen point the surface of a ten-acre subject. Speakers welcome the telephone dinner as heartily at least as their listeners. Why hasn't some one remarked that the new plan proposes to annihilate that abomination, the reception committee in Prince Albert coats? That is the sort of thing we mean by "progress." And no more low-necked hacks transporting the speaker of the evening up Main street to the Commercial Hotel, with three citizens assigned to pester him persistently right up until dinner-time!

At a telephone banquet every one can hear equally well. A speech worth listening to will penetrate to the most distant corner of the dining hall, for seating arrangements will matter not one whit. Though chair legs squeak uneasily and well-fed males sigh and cough to an accompaniment of crackling shirt bosoms, the speaker never will know; at the same time, the truly interested listener will continue to hear every word.

Once the sense of novelty wears off a bit, the quality of speaking must needs improve. After-dinner wit is soon to possess the quality Shakespeare said was its soul, and delivery is to become less artificial.

On account of telephone tolls, stop-watch law will be strictly enforced. A speaker may show the very smallest regard for the time of fellow-banqueters, but every one has been trained to hold a healthy respect for the time of the operator of a toll board.

The consumer has this joyful promise of brevity. But the orator, too, rejoices. He knows that now he will be more natural and do a better class of work. For one thing, the telephone idea means nothing less important than a decrease of dressing up among our greats and near-greats.

"The Speaker is in the Best of Spirits."

With a telephone in their rooms, they may sit in dressing gown and slippers and talk at ease to comfortable-minded listeners. The speaker is, of necessity, in the best of spirits. Not only does he evade ruining his digestion with countless "banquets"—he also saves his temper by not having to shave and by not having to tie innumerable dress ties. Under this new system he may frequently see his wife and children, and if he happens to be "indisposed" or is at all bashful or ever has had stage fright, the telephone speech will be welcomed as one of the choicest blessings of an age of science.

"The Mad Joy of at Last Being Able to Shut Off a Flow of Oratory."

Seventy thousand places may now be reached by telephone in the United States, but this information is of

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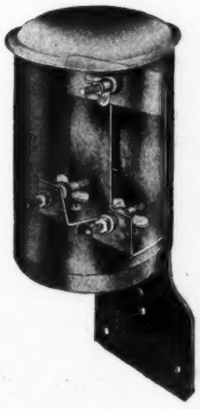

The Arrester that is getting the attention—

WHY?

Because it is killing that expense of making long drives over party lines looking for a partially grounded carbon, the trouble that is so often difficult and expensive to locate. This accounts for this arrester finding its way into almost every rebuilding order. The day of lightning trouble is passing. Write for particulars and prices.

Metallic Lightning Arrester Company

Winona, Minnesota

little use to the person who wants to reach only one place and is told that the wire is busy.

The Loyal Linemen.

The names of great men we find carved upon stone,
And their deeds may be seen at a glance;
But for heroes whom history does not record
See the linemen who work in the ranks!

When the rain falls in torrents, and lightning's fierce gleam
Make the heavens a wonder to view,
The very first men who are called to go out
Are the linemen who work in the crew!

When the sleet works such havoc with pole lines and wire
And the snow's on the ground in great banks,
The men whom you want in this hour of distress
Are the linemen who work in the ranks!

For a smile that is honest, with meaning as well,
For a handshake that's hearty and true,
I would not go further but stop when I meet
The linemen who work in the crew!

If I were a poet with gifted pen,
Or the president of several banks,
I'd see that due honors were paid to these men—
To the linemen who work in the ranks!

With kings I might banquet—with emperors dine,
Of the good things of life get my due,
But my heart would still be where it ever has been:
With the linemen who work in the crew!

—O. D. Green.

Telephoning in Paris.

There was recently an amusing article in the French paper Le Matin headed "Hullo! Hullo!" describing a definite and registered attempt to find out how long it took to get through to a number in France. It ran as follows: "People in New York are furious. From statistics the official commission of public service informs them that it takes six seconds at least to get a telephone communication. Six seconds . . . But that is a century! I do not advise the noble citizens of New York to come and settle in Paris. Their anger would certainly become fiercer, and I am sure at certain moments it would turn into fury.

"Anyhow, to calm them I will give them these French statistics, as follows: Yesterday, I desired to find out, by chronometer, the average time Paris took to arrive at a conversation with two private owners of a telephone. But I am far too scientific by nature to approach such an experiment with levity. I surrounded myself, as the saying is, with all necessary guarantees. I got an official timekeeper of the Aero Club, Baron de Thuan, to accompany me. And from 3 o'clock in the afternoon until 6 I telephoned to the four corners of Paris, while M. Thuan impassively took the time of my conversations. I took, be it observed, the most ordinary hours of the day. I did not want to telephone at midday, because at 12 o'clock some telephone girls have not yet lunched while others are still having theirs. I did not try to get a telephone number at 11 o'clock at night. I know that at that hour the operators sometimes sleep, and I hate disturbing folk. To be brief, I telephoned eighteen times in the afternoon, including in my calls, M. Bernstein, the shed of the Bayard-Clement airship, the office of the Matin, a painter and a pastry cook.

"M. de Thuan severely took the average of my 'time.' It was 1 minute, 20⅘ seconds. It takes thirteen times longer in Paris than in New York to telephone. (Signed) Maurice Prase, recordman of telephone communication in France."

In the following remarks M. Bouchard, the director of the Paris telephone, gives his reasons for this delay, which the Matin published on the following day: "First, if New York counts six seconds before getting a communication, that is to say that they count from the moment the receiver is taken off to when they get their number, we have carried out experiments and we find that Paris only takes twice as long from the first moment of telephoning. This is also largely due to the fact that in America the telephone operators are younger, and here where they are often married women you cannot expect them to give such undivided attention to their work."

"Such," comments the editor, "are the remarks of the director—they are worth reproducing," he adds dryly.

Ballad of a Busy Line.

She opened the door, and came in with a smile,
An air that was coaxing and bland,
Displaying a gown in very neat style,
And a dear little delicate hand
Which she put out and closed on my telephone book,
Then she drew up a chair—Oh! that innocent look!—
And she lifted the 'phone from the hook.

The minutes flew by, but the voice tinkled on—
"Matinee, walnut fudge, curly hair,"—
I didn't grow nervous till three hours were gone.
And she'd lunched on a chocolate eclair;
But she kept a close grasp on my telephone book,
She never discarded her innocent look,
And she still kept the 'phone off the hook.

The evening came slowly and drearily down,
Then the stars twinkled clear in the sky,
And the dinner was ready all over the town.
When she finally murmured "good-by,"
When she finally put down my telephone book,
Thanked me again with an innocent look,
And hung up the 'phone on the hook.

She had cost me three tips on the market, I learned,
When I reckoned my losses next day—
Two invitations to supper I'd earned—
And a seat at a popular play;
Estranged my relations, offended my wife
And given my creditors pain,
But I've taken a vow for the rest of my life,
And I never shall suffer again
For the lady who seizes the telephone book,
And thinks me repaid by that innocent look
As she takes down the 'phone from the hook.

—Exchange.

"Got a notice from the telephone company this morning promising better service the first of the month."

"Must have paid up."

"Nope; owe 'em for a year."

"Is that the system?"

"Appears to be. Notice said I was one year in arrears for my telephone, and if I didn't settle by the first of the month I'd hear from it."

The telephone girl in a certain hotel answered a queer call over the house exchange the other morning about eleven o'clock. When she "plugged in" a man's voice said:

"Hello, is this the So-and-So Hotel?"

"No," replied the girl, who was slightly surprised. "This is the Such-and-Such Hotel."

"Oh, all right," said the man. "Just woke up and didn't know where I was."—Telephone Review.

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Ship in any Quantity. Standard and Special Sizes.
SOUTHERN PINE MFG. CO., PADUCAH, KY.

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WHITE AND WESTERN CEDAR POLES
Profit by our exceptional experiences and facilities.
Get our quotations.
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From Factory and Salesroom

First Automatic Installation in Australia.

The installation of the automatic telephone equipment in the exchange at Geelong, Australia, has just been completed, according to advices received by the Automatic Electric Co., of Chicago, manufacturers of the apparatus. This system consists of 1,400 lines of central office equipment, the complete installation of which was made under the supervision of the Automatic Electric Co.

This is the first installation of automatic equipment in Australia. It was made after an exhaustive study by the engineers of the Australian government under whose jurisdiction the telephone system is operated.

The installation of the system has met with pronounced success and tenders have been called for automatic equipment to be installed in a number of other cities, among them being exchanges for Adelaide, Sydney and Perth.

Some of the Crouse-Hinds Construction Specialties.

The accompanying illustrations are interesting as they present in use, two of the specialties of the Crouse-Hinds Co. of Syracuse, N. Y. While it is true that the Crouse-Hinds' anchor and Adjustarod are quite extensively used by telephone companies, yet a big demand for them has been created in the telegraph, light and power and electric railway fields.

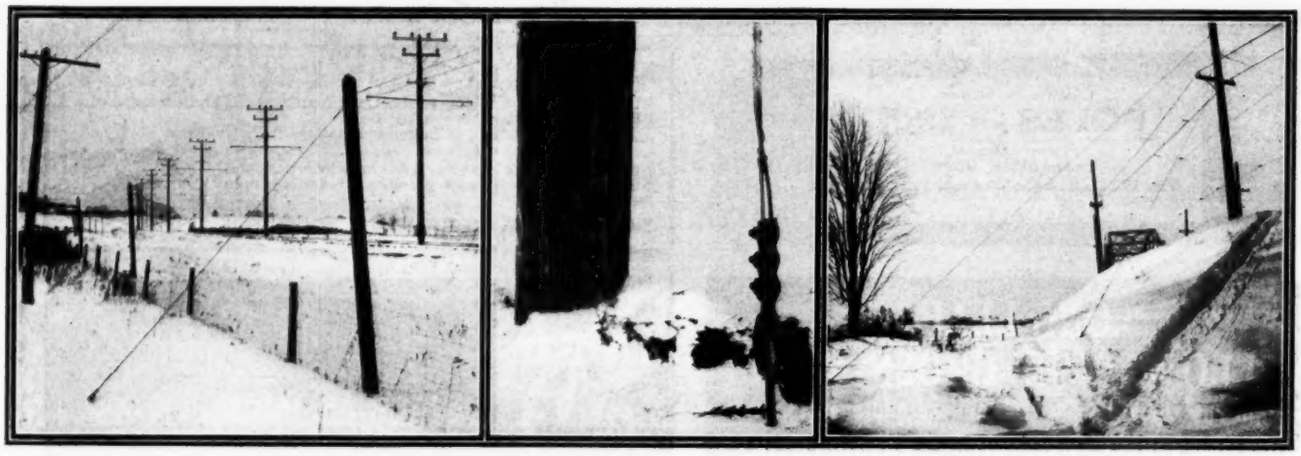
The views show installations of the Adjustarod and anchors along the lines of the Syracuse & South Bay Railroad Co. and the Syracuse, Lake Shore and Northern Railroad Co. in Central New York.

The Crouse-Hinds anchor is said to be exceptionally easy to install and can be done by one man. The anchor is simply driven by a sledge and is set by a pull. The head is reinforced so as to withstand the pounding of the sledge. Steel of a selected grade is used in the manufacture of the anchor. It is five feet in length and weighs twenty-three pounds.

The Adjustarod or anchor rod, as one of its users advises, can be employed to good advantage as a substitute for the troublesome thimble which turns around and which when the guy wire is pulled, requires constant pounding to keep it in position. The Adjustarod can be installed close to the pole, which often is desirable on account of nearness to walks and buildings.

It is made in two different styles, each of which operates as a turnbuckle to regulate the guy wire tension. The type shown in the illustration combines clamps, pulley, swivel, rod washer and base nut. The other type has an eye for the guy wire, swivel, rod, washer and base nut.

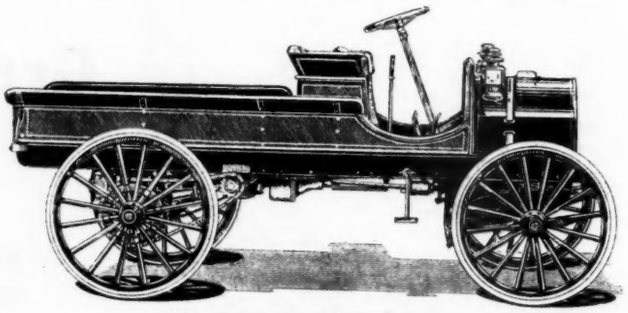
The Crouse-Hinds Co. will be pleased to correspond with any telephone companies which desire to receive further information regarding these construction specialties.



Crouse-Hinds Adjustarods and Anchors, as Installed on Lines of Two New York State Railroads.

A New, Light Weight Motor Truck.

The Chase Motor Truck Co., of Syracuse, N. Y., has just placed on the market a new motor truck which is said to be admirably suited to the needs of telephone companies. It weighs 1,500 pounds and has a load capacity of 500 pounds. The wheel base is 84 inches and it has a standard tread of 58 inches. The outside dimensions are 8 ft. x 42 in. and inside it is 4 ft. 10 in. x 40 in. x 9 in. back of the seat.



The New Chase Motor Truck.

A 12 horsepower two cylinder engine is used to drive the wagon and it is claimed that a gallon of gasoline suffices to cover a distance of 15 miles. High tension magneto ignition with fixed spark double side chain drive and duplex type brake, direct on rear wheels are some of the features of this model M truck.

The truck is supplied in the express type shown in the illustration and may also be had with a panel top. The Chase company has made low price on the new model and its long experience in motor truck manufacturing is a guarantee of the efficiency and durability of the wagon. Great things are anticipated for the truck as the company is confident of its immediate success.

England Financing Take-Over of National.

Exchequer bonds to the amount of £3,800,000 have been placed through Messrs. Rothschild, says a London cable, for a £2,000,000 India loan in 3 per cent. bonds at 96, redeemable in four years at par and thus actually yielding

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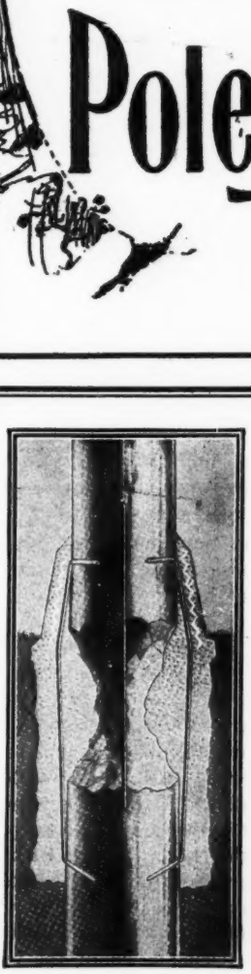

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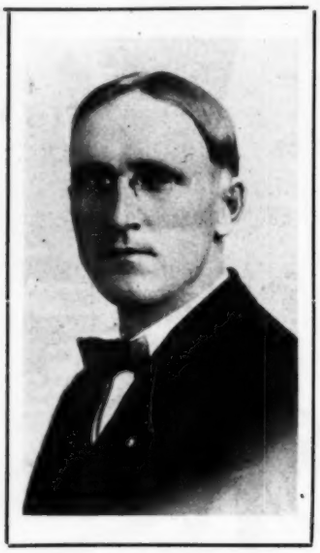
over 4 per cent. The amount represents an installment due from the government on account of the National Telephone transfer and more will probably be issued later.

Tri-State Cedar Company—Pole Producers.

The Tri-State Cedar Co. has been incorporated, with headquarters at Coeur d'Alene, Idaho. Its officers are J. A. Irvine, of Stillwater, Minn., president; J. R. Kolliner, of Stillwater, Minn., vice-president; C. J. Winton, of Minneapolis, Minn., treasurer, and Neil Burrell, of Coeur d'Alene, Idaho, secretary and manager. Mr. Burrell formerly was identified with the Valentine-Clark Co. as superintendent of its Minnesota transfer yard and manager of its Western operations at St. Maries, Idaho.



Neill Burrell.

The new concern will deal exclusively in cedar poles and will produce them from its own timber in the states of Washington, Idaho and Montana. Being well equipped in all respects and thoroughly experienced as regards the requirements of the field, the new company will doubtless enjoy a very lucrative patronage from the start. Mr. Burrell's many friends in the telephone field will welcome the opportunity of favoring him with a portion of their business.

Paragraphs.

J. C. MURRAY has been appointed manager of the foreign department of the Kellogg Switchboard & Supply Co., of Chicago. He will divide his time between Chicago and his New York office. This business has grown to large proportions, and it is believed that the foreign sales will soon equal the domestic output. Mr. Murray will not be missing entirely from sales work in America, where he is so well known.

Sturtevant Telephone Booth Ventilator.

The Sturtevant telephone booth ventilator, patented, has been brought out by the B. F. Sturtevant Co., of Hyde Park, Boston, Mass., for the purpose of changing the air within a telephone booth, by blowing fresh air into the booth, and supplying an exit for the impure air from the booth. It consists of a fan wheel of the Sturtevant multivane type, running inside a casing of pressed steel, and directly connected to an electric motor, the casing and motor being securely fastened together. Mounted upon felt pads on the top of the telephone booth, the ventilator blows air into the booths, while special slide gates set in the walls of the booths allow the air to escape from it.

The air blown into the top of the booth is admitted through a short pipe, made of fibre, and is prevented from striking directly upon the head of the occupant by a diffuser. One slide gate is placed at the bottom of the inside wall of the booth, and the other in the top of the outside wall. With this arrangement the air leaves the booth at the bottom, passes through the dead air space between the two walls, and goes out at the top. With booths having in-swinging doors, there is so much leakage that no slide gates are necessary.

The cost of operating a Sturtevant electric telephone booth ventilator is very slight and it may be stopped when the booth is not occupied, if desired. Careful design and construction make the operation of the ventilator almost noiseless.

The telephone booths in the North Station at Boston, Mass.,

Sturtevant Booth Ventilator in Operation.

were equipped with ventilators last year and have been so successful that all the booths in the South Terminal Station in the same city are being equipped this year.

Demise of Jacob Baur.

Jacob Baur, founder, president and treasurer of the Liquid Carbonic Co., of Chicago, died recently at Michael Reese Hospital, Chicago. Up to a few days before his death Mr. Baur was apparently in his accustomed robust health, but malignant intestinal trouble set in and after a week at the hospital an operation was resorted to as the last recourse. From this operation Mr. Baur never recovered. The interment was at Terre Haute, Ind. Mr. Baur leaves a widow and a 15-months-old daughter.

Jacob Bauer.

Jacob Baur was born in Louisville, Ky., October 12, 1856. He attended the public schools at Terre Haute, Ind., and at the age of fourteen began clerking in his father's drug store in that city. Later he attended the Philadelphia College of Pharmacy, graduating in 1881. On returning from college the young man was given the management of his father's store and showed such marked business ability that he almost doubled the previous year's business

From the first he made soda water a scientific study and developed that feature of his retail drug business to a point where he saw its world-wide possibilities.

This study led to his development of a process for liquefying carbonic acid gas, and his formation of a company and the erection of a primitive plant in Chicago—this in 1888—for its manufacture.

From this humble beginning the company grew, year by year, to a point where it is stated to be the largest soda fountain, carbonator, gas and supply house in the world.